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SOCIOLOGICAL ASPECTS OF THE RECENT HEALTH DEPARTMENT REORGANIZATION IN NEW YORK STATE.

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Read before the Sociological Section, American Public Health Association, Colorado Springs, September, 1913.

I suppose I have used the words "social" and "sociological" as frequently, as loosely, and as rashly as has any one. When I came to outline the sociological aspects of the recent health reorganization in New York State, I was impressed by the absence in my own mind of a very definite conception as to the meaning of the words and, rather shamefacedly, I consulted Webster. That may be a daring statement with which to introduce a paper but my temerity goes to even greater extremes, for I'm going to quote the definition. "Sociology is that science which investigates the laws and forces which regulate human society in all its grades, existing and historical, savage and civilized." In New York we have all grades of society. We are also partly savage and partly civilized. The breadth of meaning given the word accounts for its universally hazy application; it also justifies me in challenging any one to mention anything which is *not* sociological, within or without the reorganized health department. However, I hope to emphasize a few of the points which may be said to be "sociologicaler."

Without entering into the details of the departmental reorganization, with which you are undoubtedly familiar, it may be well in the first place to briefly review those phases of the law as it stands today which are of special significance from our present point of view.

Section 3 of the law states that there shall be nine divisions of the new state department, the more important of which are as follows.

1. Division of Administration.
2. Division of Communicable Diseases.

3. Division of Vital Statistics.
4. Division of Publicity and Education.
5. Division of Child Hygiene.
6. Division of Public Health Nursing.
7. Division of Tuberculosis.

We can discuss only those phases of the law which are of greatest importance from a sociological standpoint. These, in turn, may be classified as either concrete steps in legislative health progress as actually embodied in the law, or, on the other hand, as abstract philosophical principles indicated and emphasized by the tendencies of the legislation under discussion.

As concrete examples we may take the following:

1. An Increase in the Powers and Duties of the State Officials.

The law states that the term of office of the commissioner shall be six years (p. 1). The necessity for the services in this position of a specially trained man, who shall be able to make the work his chief occupation, is recognized by the provision of the law which increases his salary to $8,000 per year (p. 3) and by the clause which states that "during his term of office he shall not engage in any occupation which would conflict with the performance of his official duties" (p. 1). He has the power to divide the state into sanitary districts and to appoint supervisors for the same (p. 5). He is empowered to appoint local health officers in communities where the local boards fail to make the appointment (p. 7). These, and other measures applying to the sanction of the sanitary code (pp. 2 and 3), and to the financial compensation (p. 9), the tenure of office (p. 8), and powers (p. 12) of the local health officer, all reflect that democratic tendency in American governmental reform which is manifested by the centralization of power and the enhancing of official responsibility.

2. Improved Statistics as to Nativity, Morbidity and Mortality.

The provisions of the law in this regard reflect the awakening social consciousness of the community at large and the desire on the part of the community for a keener social sense of direction. The sanitary supervisors are encouraged to "promote efficient registration of births and deaths" (p. 5); the local health officers are specifically commanded to "take such steps as may be necessary to secure prompt and full reports by physicians of communicable diseases, and prompt and full registration of births and deaths" (p. 12).

3. An Annual Sanitary Survey.

The demand on the part of society for rational social book-keeping is further recognized by that provision under "the powers and duties of health officers" which states that they are to "make an annual sanitary survey and maintain a continuous sanitary supervision over the territory within their jurisdiction" (p. 12).

4. A Medical Inspection of School Children and School Equipment.

It was recognized by the legislators that the most delicate criterion of social progress is the welfare of society's future citizens. The law states that there shall be "a medical examination of every school child as soon as practicable after the opening of each school year." It adds that there shall be "a sanitary inspection periodically of all school buildings . . . . and report thereon to those responsible for the maintenance of such school buildings" (p. 12).

5. Provision for Public Nursing.

A keen social indicator is the care which society takes of its disabled members. Generous provision is made for public health nurses. Perhaps never before has actual legislation gone into such detail concerning this important health activity. To quote the law again: "Each health officer . . . . shall have power to employ such number of public health nurses as in his judgment may be necessary within the limits of the appropriation. . . . . They . . . . may be assigned by him to the reduction of infant mortality, the examination or visitation of school children, or children excluded from school, the discovery or visitation of cases of tuberculosis, the visitation of the sick who may be unable otherwise to secure adequate care, the instruction of members of households in which there is a sick person, or to such other duties as may seem to him appropriate" (p. 13).

6. The Coöperation of Medical Organizations.

The value of utilizing positive, constructive, coöperative methods in social and sanitary reform is exemplified by that provision under the duties of the sanitary supervisor which admonishes him to "endeavor to enlist the coöperation of all the organizations of physicians within his district in the improvement of the public health therein" (p. 6).

7. The Public Health Council.

This council, consisting of seven members, appointed by the governor, is a most important feature. It is given power to enact laws for the preservation of health and the prevention of disease, and these laws are to go into force upon enactment, and supersede any previous local health regulations inconsistent with them, except in New York City. The council is to be made up of two laymen, one sanitary engineer, three physicians and the commissioner.

8. It may be mentioned here that a complete, new vital statistics law was also enacted, in form essentially as recommended by the Federal United States Bureau.

Time forbids detailed reference to the many other concrete examples of social progress. More fundamental, perhaps, are the somewhat abstract principles fully recognized in the health reorganization. These also lend themselves, though perhaps less readily than the former, to tabulation, and we will briefly deal with the more important ones:

1. Unification, Coördination, Centralization in Health Administration.

That the problems of one community are much the same as those of another community, and that a common solution, perhaps with special modifications, is frequently applicable to all, may have been long recognized in theory, but surely these principles have seldom been actually applied in health work. The demand for coördinate activity is met by special provisions which impower the sanitary supervisor "to call together the local health officers within his district or any portion of it from time to time for conference" (p. 5); which demand of the health officers that they "attend the annual conferences of sanitary officers called by the State Department of Health, and local conferences in the sanitary district" (p. 13). It is well for the state's right hand to know what the other hand is doing. As an illustration of the centralization of power it is specifically enacted that "the provisions of the sanitary code shall, as to matters to which it relates, and in the territory prescribed therefor by the public health council, supersede all local ordinances heretofore or hereafter enacted inconsistent therewith" (p. 3).

2. The Educational Point of View.

It has long been generally held and even quite recently stated on supposedly high authority that the chief function of a health department is the control of contagious disease. Usually the emphasis has been on preventive medicine, and on negative efforts to prevent sickness. A broader field is now being recognized—that of positive, constructive health work. Perhaps the most fundamental manifestation of this recognition of a new responsibility is the emphasis which modern health programs give to educational health activity. The sanitary supervisors in the reorganized health department of New York state are told to "promote the information of the general public in all matters pertaining to the public health" (p. 6); the local health officers have prescribed to them, as part of their duties, the promotion of the "spread of information as to the causes, nature and prevention of prevalent diseases, and the preservation and improvement of health" (p. 12).

3. The Constructive Work of Medical School Inspection.

This also illustrates a positive health attitude. The inspection is not only for the purpose of preventing disease, but is also aimed at the promotion of the vigor, vitality and efficiency of the school child.

4. A more rational distribution of effort and utilization of funds are characteristic tendencies of the new law in New York state. The health officers of the future may devote more time to social and sanitary surveys, constructive work among school children, the improvement of vital statistics and like endeavors, and waste less effort on the abatement of nuisances, the cleaning of chicken coops, and the removal of dead dogs.

On the whole the reorganization of the health department in the state of

New York was a very important step in advance, not only in health organization, but in social development. The movement, from its inception at an early conference with the new governor to the signing of the bill, was characterized by a broad social conception of duties and responsibilities. The law gives to the health organization a great degree of elasticity. Its potentiality for adaptation to special, unusual conditions is remarkable. Under the direction of a well-trained, broad-gauged health expert it should be an effective instrument in the hands of society's representative for the establishment of a more sound physical basis upon which we may build a more perfect social structure. For effective, creative health work the material and opportunities are bountiful; the knowledge and the means are at hand; the instrument, in the Empire State, at least, is but recently revised and modernized. There is a tremendous opportunity for a commissioner with an imagination and with an ideal to demonstrate that the most enduring basis for social evolution is the health of the people.

SOCIOLOGICAL ASPECTS OF RECENT REORGANIZATIONS OF HEALTH DEPARTMENTS, CLEVELAND, OHIO.

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Secretary Anti-Tuberculosis League.

Read before the Sociological Section, American Public Health Association, Colorado Springs, September, 1913.

At the present time, and for the last three years, Cleveland has had a health board composed of five members appointed by the mayor, for periods of one to five years. During this time there has been a greater growth and development of the city's health activities than ever before. A Tenement House Department has been organized and is in successful operation. A Bureau of Tuberculosis, employing twenty nurses and centering all the tuberculosis work in the city has been placed in operation. A Bureau of Child Hygiene, with the establishment of twenty prophylactic babies' dispensaries, and the employment of thirty nurses, is in operation. Full-time district physicians are being employed, a Bureau of Occupational Diseases is being organized and, taking it all in all, there is scarcely a city in the United States where a greater development of its health department has taken place in such a short time. And this, mind you, under a health board.

Early in the spring of the year, in accordance with the provisions of the newly adopted state constitution, Cleveland set about to provide itself with a new charter, and a commission of fifteen members was elected by the people to draft this charter and later submit it to them for their approval. One of the most perplexing and important questions that presented itself was "What shall be done with the health department?" Shall provision be made in the new charter for the operation of the health department by a board, insuring perhaps in certain instances health legislation in advance of public opinion and support—insuring, too, permanency in office—*but*, through this very arrangement of board control, separating the health department from other and closely related departments of the city government, making it independent of the mayor and city council. Or, shall the board be abolished, the provisions of the charter made uniform, and the health department and its activities brought into closer relationship with the activities of other departments and health legislation entrusted to the council?

The commission adopted the latter plan. Provision is made for the establishment of six departments:

(1) Department of Law.
(2) Department of Public Service.
(3) Department of Public Welfare.

(4) Department of Public Safety.
(5) Department of Finance.
(6) Department of Public Utilities.

Each department will be in charge of a director, appointed by the mayor; each division will be in charge of a commissioner, appointed by the director; and the officers under the divisions will be appointed by the commissioners, subject to civil service rules.

The Department of Public Welfare, the one we are particularly interested in, will have five divisions:

(a) Health.
(b) Charities and correction.
(c) Recreation.
(d) Research and publicity.
(e) Immigration and employment.

This, then, is a brief statement of the old scheme of operation and of the new, which will go into effect on January 1, 1914.

What have been the objections to this new department, and what can we hope for in the development of it? There have been two main objections:

First, that the city council, either because of ignorance, indifference or political pressure, cannot be expected to enact the necessary health legislation;

Second, that the new plan of organization will not make for continuous service; in other words, the health department will be "thrown into politics."

It is not proposed in this paper to take up a discussion of these objections. The conditions in different communities differ, and a scheme of organization and operation that works successfully in one may be a failure in another.

In order that you may appreciate the advantages of the new arrangement, I have prepared in some detail the development of the various divisions of the Public Welfare Department. (See Charts II, III, IV, V and VI.) The black indicates that now in operation; the red is the development of the future.

During the last four or five years there has been tremendous activity in practically all our American cities in an attempt to more thoroughly understand and in part to provide remedies for the social and economic conditions which cause a large percentage of the high mortality, general debility, unhappiness, poverty and diseased moral conditions in all communities of any size. Charitable organizations of every description are in the field attempting to handle some phase of the problem and are demonstrating the value of their methods in the handling of the difficult medical, social and economic problems presenting themselves for solution.

As the work of these organizations has grown and developed, as the underlying causes have come to be more thoroughly understood, as more points of contact in the daily routine have been developed and greater

efficiency has come to be desired, there has come the realization of the absolute necessity of coöperation and correlation of effort. There has come a sincere appreciation of this fact, that the success and efficiency of any one organization is in direct proportion to the success and efficiency of every other essential organization in the field whose work touches theirs. There has come, too, as the size and extent of the problems facing us have come to be more thoroughly understood, a realization that some of these problems, not all of them, will be worked out only as they are put under public control and financed and developed in a large way as the situation may demand.

There are a number of communities where the public at large and the public officials have become sufficiently educated to warrant the transfer to the municipality of a large share of the work formerly under private control, and increased financial support and extension of the work have been the results. But, this one thought should be kept fully in mind; as we all prepare to shift these burdens, we should bend every effort to make possible the development under municipal control of every phase of activity—medical—social—which, in a limited way, we have demonstrated are essential in order to secure successful results.

In order that this point may be more thoroughly appreciated, let us, for example, analyze the steps necessary in the handling of a family in which there is a case of tuberculosis. The control and management of this disease, essentially a medical problem, heads up in the health department, because it is a communicable disease. Effective treatment requires that there be:

1. An examination in the dispensary.
2. The nurse visiting in the home instructing and making sociological investigation.
3. Adequate hospital or sanatorium accommodation for the patient.
4. A preventorium or open air school for anæmic and predisposed children.
5. The placing of children to enable their mother to work.
6. The finding of employment.
7. Temporary or prolonged material relief to supplement family income.
8. Detailed investigation of living and working conditions, with a view to determining the predisposing causes.

The development of the machinery to handle each one of these steps cannot take place under the health division, so they are developing in other divisions; hospitals, sanatoria and preventoria, under the charities and correction division; preventive measures, in the shape of playgrounds, public baths, etc., under the division of play and recreation; research work, undertaken and carried through in the division of research and publicity.

This development of social work under the municipality must of necessity be slow. Private organizations having interested the municipality in assuming burdens new to the municipality, their moral responsibility still

remains and, in a sense, is greatly increased as a result of the enlarged field of activity and the greater good to be accomplished.

Bear in mind that the Public Welfare Department is a provision of the charter of the city of Cleveland and is looking ahead twenty or twenty-five years. As a result of its organization there is bound to be some rearrangement of the publicly and privately controlled charitable work, but the municipality cannot in any large way undertake the work now being done by private organizations until it gradually demonstrates its ability to do the work as well, or better, than it is being done.

By the establishment of a division of immigration and employment we hope to get into closer touch with the future citizens of our city than we have been; make it possible for them to learn English; safeguard and help them from the time of their arrival instead of waiting to see how they will be able to make it without dependable aid and, for the most part, alone.

We are slowly awakening to the fact that health is a thing to be talked about. The conservatism and secrecy of the medical profession in regard to disease and its treatment are receiving scant courtesy in the face of the public demand for more detailed and accurate information concerning disease—what it is, and how to avoid it.

The publicity division will undertake a systematic education of every group of citizens in the city upon health matters, and through this division the public will come to see and appreciate the relationship that exists between health and methods of living, and that between working and recreating. Moreover, the public will come to a better appreciation of the medical, social and moral problems that confront the city as a whole. They will come to consider the Department of Public Welfare as the one department of this city government which deals with the problems concerning us as human beings, the right solution of which makes for longer and happier lives, and more useful citizens. Gradually we will get away from the old consideration of all matters of health from an individual standpoint and treat them, as in the city we must, as community problems. Instead of treating disease after it has developed, through coöperation and through correlation of all social, public and private effort, we will get a grip on the predisposing causes of disease and we will begin with the treatment of the cause at the beginning, instead of dealing with results at the end.

Whether the Public Welfare Department of the city of Cleveland succeeds will depend upon the same close interest and personal service of the group of workers who have made our private charitable work a success. With their coöperation, their moral support, the success of this new department will know no bound. Working shoulder to shoulder, the public official and the private volunteer, great strides can be made, disease can be eradicated, stronger and better men and women will be the result and Cleveland will come to be the best, the most wholesome of all cities in which to work and live. It will become, in very truth, "The City upon a Hill."

PROGRESS IN REORGANIZING THE MINNEAPOLIS HEALTH DEPARTMENT.

FREDERIC BASS.

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THE CITY.

Minneapolis, sixty years ago an Indian reservation, today has one person for each seven acres, a population of 325,000 in fifty-three square miles. It has no densely crowded areas and no slums in the degree that such are found in many American cities; the most densely populated acre holds 164 persons. Sixty-three thousand families live in 43,000 dwellings, one and thirty-four hundredths families per dwelling.

Of the total population, 71 per cent. is native white and 28 per cent. is foreign white. The Negro, Indian and Mongolian population make up the remaining 1 per cent. Of the foreign-born white population 83 per cent. are from Canada and northern Europe, all hardy races. Southern Europeans, Negroes and Mongolians make up, therefore, less than 6 per cent. of the total population. There is an illiteracy of 2.02 per cent.; 65 per cent. of the children of school age attend school.

The city is beautifully situated upon the Mississippi River; it has extensive parks, equivalent to one acre for each one hundred persons, with excellent street railway facilities for reaching them. The climate is comparatively dry, the relative humidity averaging 74 per cent. and the annual rainfall twenty-nine inches. The death-rate of 10.44 per 1,000 is one of the lowest of the registration cities and may be accounted for by the favorable climate, the hardy and intelligent population and absence of overcrowding and slums.

THE CIVIC AND COMMERCE ASSOCIATION.

In 1911 there was formed by a committee of influential citizens of Minneapolis a league known as the Civic and Commerce Association, the aim of which was directed toward the unifying of efforts in the upbuilding of the city in civic and commercial affairs. It has at the present time a membership of approximately 2,000 men and is amply financed. The membership is organized into committees, among which is that on public health.

THE PUBLIC HEALTH COMMITTEE.

The Public Health Committee was organized in the winter of 1911–12 under the chairmanship of Dr. J. W. Bell. Among the members was Dr. F. F. Wesbrook, a former president of the American Public Health Association. The membership included about twenty business and professional men. At the first few meetings, various miscellaneous local affairs pertaining to the health department of the city were discussed.

There appeared to be no department of the city government which did not have some connection with the public health and the scope of the committee's work appeared to be that of investigating the entire city government and many private or semi-private activities as well. The building inspector's department had charge of sanitary construction in new buildings; the street commissioners, who were practically street foremen, one for each ward, cleaned the streets; the city engineer controlled the water and sewer systems; the health department spent 65 per cent. of its income collecting garbage and ashes, 10 per cent. more in smoke inspection,—three-fourths of the health funds for engineering work and but one-twentieth for the greatest problem in public health today, the prevention and suppression of tuberculosis; the Board of Charities and Corrections controlled the city hospital and the tuberculosis sanitorium. The Associated Charities and one life insurance company were doing practically all the tuberculosis visiting nurse work done in the city.

It was evidently necessary for the committee to limit its activities, so the chairman appointed a sub-committee on scope and method of work. The sub-committee brought in the following report, which was adopted;

"(1) That the work of the committee be for the present limited to the direct prevention of communicable diseases and the reduction of unnecessary mortality.

"(2) That the committee make a careful examination of the budgets and work of existing city boards and departments engaged in the direct disease prevention and prepare a practicable plan for the consolidation of this work and the coöperation of the departments concerned.

"(3) That a plan for the coördination of public and private efforts for public health be formed.

"(4) That the committee make a request from the Board of Directors of the Civic and Commerce Association for an allowance of $2,000 for one year, this sum to be used for office rent, and the services of secretary and stenographer.

"(5) That the committee formulate a policy of publicity and education which shall be effective as soon as the services of a secretary are obtained.

"(6) That the committee plan to arrange the data collected so that a reasonable health budget with ample support may be presented to the next Board of Tax Levy."

The first three recommendations defined the work to be done. The fourth recommendation the Board of Directors of the Civic and Commerce Association felt unable to accept and for that reason the fifth recommendation, that of formulating a policy of publicity and education, was necessarily delayed.

In May, 1912, the Woman's Club of the city voted to spend $2,500 for a

survey of the health conditions in the city, and, knowing of the movement commenced by the Civic and Commerce Association, decided to join forces with that organization.

The work of collecting, analyzing and collating data appeared to be a task beyond the ability of the members of the committee to execute personally, so that it was decided to employ one or more experts to report upon the situation. In July of the same year, the services of Dr. Herman M. Biggs and Prof. C.-E. A. Winslow of New York were engaged, and in September a preliminary report was submitted to the Committee on Public Health. The committee then in a series of bi-weekly meetings, at which representatives of the various city departments concerned were invited to be present, discussed the recommendations of the preliminary report.

The Report of Messrs. Biggs and Winslow.

In their report, Messrs. Biggs and Winslow reviewed the history and existing conditions in the city of Minneapolis and compared them with conditions in other cities. It was pointed out that twenty years ago, when the Minneapolis health organization came into existence, the main duty of a health department was to maintain decent conditions, to attend to nuisances, complaints and to attempt to control severe epidemics after their appearance.

It was shown that the control of the health department rested with the city council; that the council was an elective body and that on that account peculiarly susceptible to the influences which would militate against the efficient execution of the law. It was stated "an effective health department must act in legislative, executive and judicial capacity, it must act freely without outside influence and it must act quickly to meet many complex emergencies." The examination of the budget for 1911, showed that out of a total appropriation of $122,900 but $47,000 was used for health purposes, the remainder being used for collection and disposal of garbage and ashes.

The necessity for increased hospital facilities in the control of communicable disease was emphasized, as was also the ridiculous inadequacy of a total of forty-five beds in the contagious ward of the city hospital. The important subjects of tuberculosis, infant mortality, and medical school-inspection were adequately dealt with. The new filtration plant was recognized as being of the finest type of construction, so that the water-borne diseases had been practically abolished. The sources of milk supply were quite thoroughly reviewed, as were also the inadequate ordinances for their sanitary control. It was held that thorough dairy inspection supplemented by education should be prosecuted. The fact was noted that while there were approximately 45,000 improved lots in the city with 26,000 sewer connections, there were 17,500 privy vaults. The inadequacy of

the sewer system was commented upon. The garbage collection and disposal was examined and the work as compared with other cities of the United States was commended; the whole of this work, however, was declared to be an engineering problem and the recommendation was made that it be transferred to another department. It was stated "In order that the energies of the health department may be bent directly and profitably toward life saving with as little distraction as possible, we believe it to be essential that it be relieved of the work of garbage collection and disposal which might well be placed under the city engineer or some other department of the city government." The housing conditions were reported as requiring more rigid ordinances. The laboratory organization of the health department was commended as excellent and no adverse criticisms were made. The tabulation of vital statistics was found to be in accordance with the best practice.

Recommendations for the reorganization of the department were made. The first essential was held to be the creation of a small, independent expert board with adequate powers of control. It was recommended that a health commissioner should be the executive of this board and under his direction there should be five divisions, as follows: (1) communicable diseases; (2) sanitation and food inspection; (3) laboratories; (4) vital statistics and publicity; (5) hospitals.

The problems requiring the immediate attention of a reorganized health department were specifically stated as follows: (1) the enlargement of hospital facilities for the care of contagious diseases and sanatoria for the treatment of tuberculosis under the health department; (2) the increase in the number of tuberculosis nurses; (3) the establishment of four consultations in the city for the prevention of infant mortality; (4) the extension of the work of the medical school-inspection; (5) a new milk ordinance calling for pasteurization by the holding system of all milk not of certified grade; (6) the rapid elimination of privy vaults; (7) the extension of the work of the laboratory.

Action of the Committee. The report was received by the committee and with certain changes which local conditions apparently demanded was adopted. The important work before the committee appeared to be the framing of a law to be introduced into the legislature meeting in the winter of 1913. To this end the committee recommended to the board of directors that an attorney be employed to draw up a bill in consultation with the committee. A bill was accordingly drawn after a study and discussion of the health laws of about forty cities of the United States.

The Bill.

The bill was entitled "An Act to Promote Public Health to Create Boards of Public Health and Hospitals, and Define Their Duties in Cities

of the First Class." In Section 1, the organization of the board was stated. It was to be appointed by the mayor who should be a member, all members to serve without compensation, two members to be physicians, both men and women eligible to appointment.

In Section 2, the general duties of the board in the conduct of its business were defined, such as the care of records, the employment of officers and agents, and the form of ordinances to be adopted.

Section 3 defined the police powers of the department and the delegation thereof to its employees.

Section 4 defined the scope of the duties of the board and is as follows: "It shall be the duty of the board to devise and adopt means and measures to promote the public health, to lessen infant and child mortality, to prevent the spread of communicable diseases and if possible exclude them from the city, to equip, maintain and conduct all existing public hospitals of the city, and to erect, equip, maintain and conduct from time to time such additional public hospitals as it may deem necessary, and to make, adopt, and enforce all rules and regulations and ordinances for the purposes aforesaid.

Section 5 was a specific enumeration of the powers mentioned in Section 4. Section 6 prescribed penalties. Section 7 gave to the board the power to levy upon all the taxable property of the city, a sum which should not exceed two mills upon the dollar, which would yield on the valuation of the city, at that time, $440,000 per annum. In Section 8, the board was given the power to condemn unhygienic buildings. In Section 9, all existing ordinances of the city were declared to be in force until ordered repealed by the board. Section 10 gave to the board the right of eminent domain. Section 11 relieved the members of the board and its employees from liability from any act done in the good faith in an attempt to carry out the provisions of the act.

The bill as outlined, was approved by the board of directors of the Association, and given to the chairman of the Hennepin County delegation to the legislature, Minneapolis being situated in Hennepin County. The chairman was a member of the Senate.

Legislative Action.

The bill was introduced into the Senate and immediately passed. It so happened that at the same time a number of bills allowing the issuance of bonds by the city were passed. It appeared that all this was done by the Senate, without consultation with the members of the House Committee, and considerable antagonism between the House and Senate members of the Hennepin County delegation developed. Although it seemed satisfactory that the bill had passed the Senate without opposition, the manner of its passing was unfortunate.

Immediately upon the passage of the bill by the Senate, the friends of "*personal freedom*" appeared before the House Committee in protest. The American League of Medical Freedom, particularly, became active, and printed copies of the bill with underlined and heavily leaded type were freely distributed, together with letters asking the receiver to influence his representative against the measure. Several hearings were held by the committee, and the active opposition appeared to be led by Christian Scientists and the osteopathic physicians. The osteopaths agreed to withdraw their opposition if the first section, the provision that two of the members shall be physicians, duly qualified and licensed to practise medicine under the laws of the state, could be eliminated. This was done, the Christian Science opposition was removed by adding to Section 4, the words; "provided, however, that nothing in this act shall be construed to empower or authorize the board to interfere in any manner with the individual's right to select the physician or mode of treatment of his choice, and provided further that nothing in this act shall be construed to compel any person or child without the consent of parent or parents, to submit to vaccination, inoculation, antitoxin, or other medicinal or other treatment, except the quarantine, segregation and isolating hereinafter provided for"; also the elimination in Section 5 of the words "to discover by the examination of premises and persons, and any other appropriate means, the existence of communicable diseases, to discover persons who have been exposed to communicable diseases," further the elimination of the entire subsection of Section 5, reading "to require persons suffering from or exposed to communicable diseases to submit to vaccination, inoculation, antitoxin, or other appropriate preventive or remedial treatment," and the sub-section of the same section, "to exercise similar powers for the promotion of the public health in relation to subjects not herein specified."

Apparently the active opposition to the bill had been removed, and in fact all of the open opposition was removed, and in a conference of the Civic and Commerce Committee with the Committee of the House, it appeared that there was no decided opposition. Information, later verified, was received that certain members of the city council, fearing loss of power, were quite active in their opposition to the bill. It seemed impossible to meet this proposition in any other way than by open argument. The committee had the strong support of the newspapers, and many favorable editorials appeared. At the same time, a furious wrangle appeared in the city council over the appointment of a new health officer; and after the health officer in power was removed, the wrangle still continued over the patronage of subordinates. In spite of all these favorable influences, the bill was not reported out of the committee, and consequently failed of passage.

It was evident that in the legislative committee, there was little knowl-

edge of the situation, and the members had little time during the session to study it. Under the circumstances, they had to take somebody's word and they naturally took the word of the members of their city council advisers rather than that of the Civic and Commerce reformers, in regard to the advisability of a health department change. Their principal argument was that too great a concentration of power would result, but the reply that the responsibility was likewise concentrated, in the mayor in this case, brought out the return that an excellent opportunity would be given the mayor to build up a political machine and thus remove the power from the people. The fallacy of this argument does not need comment, but the argument gained force because the existing mayor won his place by a narrow margin over the rising tide of socialistic votes; in fact he won his place by the abolition of the usual party line between Democrat and Republican. To vote such a mayor power would certainly alienate votes from members hoping to serve another session, as well as alienate the political support of members of the city council.

The Committee of the Civic and Commerce Association felt that in spite of its failure a considerable amount of work performed had been well directed, and that the failure was due more to lack of available energy than to lack of proper measures. The conclusion drawn was that the intimate relation of the municipal, county and state political interests was not thoroughly understood, but that in order to gain such understanding more time and patience would have been required than the members possessed. The second cause of failure was the lack of publicity and education. It was felt that of the mass of the people, very few realized the purpose and need of the measure, because of their lack of opportunity to review the facts, which might have been presented in an extended series of public meetings. Newspaper publicity was insufficient.

Several interesting occurrences followed the committees' efforts, all of which would tend towards increased efficiency of public health work by concentrating energy against the spread of communicable diseases: 1, The city council formally investigated the health department and removed the health commissioner, probably feeling that something was wrong with the personnel since a considerable amount of attention appeared to be given to the health department by the civic organizations of the city, although the system, and not the personnel was attacked, and this point was emphasized; 2, the city council divided the health department, separating the refuse collection and disposal from the health department proper and placing its management under a separate council committee, known as the Garbage and Crematory Committee; 3, the health commissioner, acting upon the recommendation of the committee, secured an opinion from the city attorney that the cost of collection of refuse might be assessed upon the property owners based upon the general theory of special assessments;

4, an opinion was secured from the city attorney that the admission and release of cases of communicable diseases from the city hospital should be certified by the health officer; 5, in the budget for 1913, the health commissioner recommended that eight nurses for the care of tuberculosis be employed instead of two as in the year before; 6, an attempt was also made to place the health officer upon a full time basis, previously his duties calling for a part of his time.

Minneapolis citizens will soon vote on a new charter. A Charter Commission has reported in favor of a commission form, and one of the commissioners proposed is a health commissioner whose duties will be practically those proposed in the bill advocated by the civic organization. The Charter Commission placed this provision in the proposed charter, at the request of the Civic and Commerce Committee, which is now awaiting the outcome of the people's vote. If this charter succeeds in passing, Minneapolis will have a chance of an ideal health department; if it fails, the efforts to amend the present charter will be continued until the fight is won.

NOTE: Since writing this paper the Commission Form of Charter has been voted upon and rejected by the citizens by a 3 to 1 vote.

BACTERIOLOGICAL METHODS FOR MEAT ANALYSIS.

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Read before the Laboratory Section, American Public Health Association, Colorado Springs, September, 1913.

The bacteriological analysis of meat, especially for securing quantitative results, appears to be employed rather infrequently, judging from the meagreness of the data available. Apparently each worker has devised his own technique, while no particular attention has been given to the technique as such. The writers undertook the investigation of certain problems relative to meat, and of necessity had to work out the technique best adapted to the purpose. It has seemed worth while to record the study thus made in order that others may profit by our labors.

When this investigation was undertaken only one described method was available to us, viz., in the work of St. John in his bacterial studies of poultry (Bul. 115, Bu. of Chem., 1908). The skin was seared and removed; then small fragments were torn from the muscular tissue. These fragments, weighing from 0.3 to 0.7 grams, were placed in 25 cc. sterile erlenmeyer flasks having the bottom covered with a layer of crushed glass and containing a definite quantity of physiological salt solution. The flask was shaken for ten minutes to dislodge the organisms. Definite quantities were then added to plain and to glycerine neutral agar. Plates were made and incubated at 37°, 20° and 1.67°C.

Since our work has been completed, there has come to our attention the second edition of Eyre's Bacteriological Technique (July, 1913) which also gives a method for meat analysis. The method differs materially from that given by St. John. The meat is minced by means of sterile scissors and forceps, placed in flasks, and bouillon added, but no glass is used. The flasks are then incubated at 42° C. for thirty minutes, shaking from time to time, or better still using an electrical shaker. Portions are inoculated into gelatin or agar and incubated at 37° C.

METHOD OF SAMPLING.

The proper sampling of solid substances is always a difficult matter; in the case of hamburger steak, a number of analyses might be made and the highest count obtained, used. To obviate the labor of making several analyses, we selected fragments from three different portions of the sample to be analyzed, and in this way secured something of an average. A number of trials showed that different portions of the same sample varied from 10 to 20 per cent., but might vary as much as 50 per cent. The sampling of

other meats is still more difficult. We would suggest that the portion to be analyzed be taken from the part showing most advanced decay as indicated by the organoleptic test. Only muscle tissue should be analyzed, all fat being discarded as tending to hold the bacteria from forming an emulsion.

Preparation of the Sample.

In the present investigation, a method previously devised by Russell and Weinzirl (Cent. f. Bakt. Abt. II Bd. III, p. 456, 1897) for the bacteriological analysis of cheese, was employed. The essential point of this method consists in triturating the meat in a mortar with sand by means of a pestle. After grinding the meat with sand for some time, a small amount of sterile salt solution is added and the grinding continued; finally the volume of the salt solution is brought to 100 cc. and the whole thoroughly mixed. Suitable dilutions are made and portions plated as usual.

The sand is sterilized in test tubes, approximately 5 grams being used to each sample. The mortar and pestle may be sterilized in the usual way, or more conveniently thoroughly flamed and allowed to cool before using. In a quiet atmosphere the number of bacteria falling into the mortar during the time of preparing the sample for the dilutions is so small as to be negligible as shown by many analyses of perfectly fresh meats.

Several trials by the shaking and the triturating methods were made and the results are given in Table I below:

TABLE I.

GIVING COMPARATIVE BACTERIAL COUNTS FROM MEAT BY THE SHAKING AND GRINDING METHODS.

No.	Bacteria per gram of meat by:	
	Shaking method.	Grinding method.
1	1,050,000	35,000,000
2	6,200,000	51,000,000
3	2,700,000	22,000,000

The trials are too few, but they apparently favor the grinding method. No doubt with experience more favorable results could be obtained with the shaking method, but it is quite obvious that many bacteria must be left in the tissue, especially when it happens to contain much connective tissue.

Dilutions Used.

Apparently other workers have employed low dilutions, usually 1 to 100 and using 1 cc. and fractions of a cc. for plating. If plates are to be secured which meet the requirements of the standard methods, viz., between 50 and 200 colonies for a 100 mm. plate, then a series of dilutions must be made, and duplicate plates made from each. Experience alone will enable the analyst to estimate the probable number of bacteria present in the sample and to calculate the necessary dilutions. For fresh meats, dilutions of 1:100 and 1:1,000, will usually suffice, but for more questionable samples 1:10,000 and 1:100,000 are necessary, and 1:1,000,000 is advisable.

Media Employed.

For quantitative purposes both gelatin and agar are available. The tendency of analysts is away from the gelatin and to substitute agar whenever possible. With this tendency the writers are in hearty sympathy, and hence nearly all our work has been done with agar medium.

Assuming that meat broth and peptone are to be used in the usual proportions, two questions then present themselves, viz., what percentage of agar, and what reaction, are the most favorable? As to the percentage of agar, the present tendency is to use either 1.5 or 1 per cent. Accordingly we attempted to determine which of these gave the more favorable results. The results obtained are given in Table II below:

TABLE II.

COMPARING BACTERIAL COUNTS ON 1 PER CENT. AND 1.5 PER CENT. AGAR.

No.	Dilution used.	Bacteria per gram in:	
		1% agar.	1.5% agar.
1	1:80,000	19,800,000	22,400,000
2	1:250,000	81,800,000	95,900,000
3	1:100,000	33,500,000	35,000,000
4	1:100,000	32,500,000	31,000,000
5	1:100,000	30,000,000	37,500,000
6	1:100,000	25,000,000	28,500,000
7	"	18,500,000	43,500,000
8	"	2,800,000	3,800,000

All the samples were hamburger steak secured in the markets. As the data show, there is a marked difference in the counts in favor of the 1.5 per cent. agar. In our work 1 cc. of the dilution was invariably added to each plate, while the amount of medium approximated 10 cc. Under these conditions the 1 per cent. agar gave poorer plates for working than

did the 1.5 per cent. agar. The colonies were generally less well defined, and the loss by spreaders was greater. These conditions lead us to adopt the 1.5 per cent. agar as the more desirable.

With respect to the reaction, 0, +1.0, +1.5 and +2.0 were tried out, and the results are given below:

TABLE III.

GIVING COMPARATIVE BACTERIAL COUNTS AT DIFFERENT REACTIONS.

No.	Bacteria in millions per gram with reaction:			
	0	+1.0	+1.5	+2.0
1	15.5	12.8	....	11.3
2	9.4	12.7	....	14.2
3	5.6	3.2	....	4.9
4	5.5	10.0	11.5	12.2
5	4.6	8.2	10.6	10.2
6	12.5	16.2	18.7	35.0
7	52.	72.	64.	80.
8	17.7	35.	42.5	47.5
9	13.2	8.8	30.	25.
10	22.	36.	35.	33.7
11	7.4	10.2	8.6	10.0
12	3.5	5.2	3.2	5.2
13	10.5	....	22.0	27.5
14	1.4	1.0	1.2	2.0
15	1.5	....	....	3.7
16	4.3	3.0	4.2	6.4
17	19.	15.	26.	34.
Total	210.6	261.4	277.5	353.1
Average	12.3	17.4	21.3	20.8

Apparently different samples of meat give higher results with varying amounts of acid in the medium. This may be accounted for on the assumption that the flora varies quite widely in different samples, or it may be largely due to a considerable factor of error inherent in the work. If the results for each reaction were averaged, and these averages compared, then the highest figure is obtained with a reaction of +1.5. This reaction is the one adopted by the committee on standard methods for milk analysis, and since milk and meat are both highly proteid, we should expect that the same reaction would be most favorable for both. On the basis of the results secured, and because the figure agrees with one already standard, we adopted +1.5 reaction for our work.

Temperature of Incubation.

The two standard temperatures, 20 and 37° C., are usually employed simultaneously. Since we were not interested in pathogens but simply in bacteria causing putrefaction, we used room temperature or 20° C. This is in harmony again with one of the temperatures permitted by the committee on milk analysis. In reality we prefer 28° C., the optimum for most saprophytes, and regret that this temperature is not more commonly used. By using 28° the time may be shortened by half, which is an important advantage.

Standard for Condemnation.

At the present time the only standard for condemning meat is the "organoleptic" test or condemnation by smell, appearance, feel, etc., and the ammonia test. In another paper we have attempted to establish a bacteriological alternative for these. Briefly we find that no bacteriological equivalent can be established for either the organoleptic or ammonia test, but an arbitrary standard must be chosen if one is to be set up at all. This is exactly what is done for milk and there is no valid reason why the same should not be done for meat. We suggest 10,000,000 bacteria per gram as the limit for sanitary purposes.

Summary.

To summarize the results of the investigation, we find that the method of triturating the sample of meat with sterile sand in a mortar is both simpler and more efficient in securing an emulsion, than the method of shaking with glass; and that the methods given by the committee on "Standard Methods for Milk Analysis" are also best adapted for meat analysis so far as they apply, viz., the use of agar, +1.5 acid, and incubation at 20° C. However, 1.5 per cent. agar was found to be preferable to 1.0 per cent.

BACTERIOLOGICAL ANALYSES OF HAMBURGER STEAK WITH REFERENCE TO SANITARY STANDARDS.

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Read before the Laboratory Section, American Public Health Association, Colorado Springs, September, 1913.

The condemnation of meats by sanitarians rests upon uncertain foundations. The commonest basis employed is the "organoleptic" test, *i. e.*, testing by the senses of sight, smell, feel, and perhaps taste. For general purposes a judgment based upon such a test may be quite satisfactory; still occasions arise when a more accurate and, if possible, more scientific test would be highly desirable. Every meat inspector, no doubt, longs at times for additional proof of the unfitness of the meat he has condemned; and especially is this true if the case is taken into court, when the lack of definiteness in the organoleptic test becomes only too apparent.

The meat inspectors have appealed to the chemists for aid, but thus far the appeal has been in vain. True, we have the Eber test for ammonia, a test which is easily and cheaply made, but which is of little value when made because meat which responds to this test is so plainly rotten that few merchants would offer it for sale and none probably would resist its condemnation.

The Food Commission of the State of Washington have occasionally appealed to the bacteriologist for aid in the condemnation of meats. A considerable number of analyses of meats of various kinds have been made in the bacteriological laboratory of the State University. Such analyses appeal to the sanitarian because of their definiteness and apparent accuracy. Certainly they aid materially in securing convictions, if a definite standard or limit for bacterial content is set up. If the meat is teeming with bacteria it is apt to be regarded as potentially rotten if not actually so, and the court is also likely to assume that the bacteria are potentially disease producing, and, therefore, a favorable decision for the inspector is almost certain.

It is comparatively a simple and easy matter to analyze meat bacteriologically; withal, our methods of analysis are fairly satisfactory and could easily be made standard. The trouble does not lie in this direction, but rather in the direction of establishing a limit for the bacterial content. If a definite limit could be established, such as cities have established for milk, then all would be easy. Logically there is no more reason for establishing one of these limits than for the other. That it is more easily done

in the case of milk, all will agree; but that it is of greater legal force is most unlikely.

So far as the writers are aware only one attempt has been made to set up a bacterial limit for meat, viz., the limit of 1,000,000 bacteria per gram, by Marxer (cited by Edelmann, Meat Hygiene, 2nd Ed., 1911, p. 325), as indicating putrefaction. This standard agrees well with the usual standards for milk, and on *a priori* grounds a gram of meat teeming with 1,000,000 bacteria of questionable character would seem to be unfit for human food. Unfortunately there are certain difficulties in the way of accepting this conclusion.

It is the purpose of this investigation to determine: (1) whether the Marxer standard is justifiable; (2) if the Marxer standard is not justifiable, then can a better one be established. To this end we undertook the examination of market hamburger steak, because (1) it would be most likely to furnish considerable numbers of bacteria; (2) it would be interesting to know what numbers of bacteria were actually present in hamburger; (3) hamburger steak is usually made from scraps of meat collected during the day from trimming of the steaks sent out; hence it is inferior meat, waste practically, and may be classed along with sausage. It is, therefore, regarded by most housewives as unfit for food. Apparently it would afford a vulnerable point of attack; (4) it would seem to be easier to set up a provisional standard for hamburger than for other meats, since the penetration of bacteria through the entire mass is more uniform; and finally (5) if we condemn meat at all on bacteriological grounds, should we not condemn hamburger first of all?

The Number of Bacteria in Market Hamburger Steak.

After working out a suitable technique as given in another paper, quantitative bacteriological analyses were made of forty-four samples of market hamburger steak. Most of the analyses were made during the cooler months of the year, hence the results are more favorable than would have been secured had the samples been taken during the summer. Again, the temperature for Seattle is more favorable for keeping fresh meat than it is in eastern and southern cities, although its winter climate is relatively warmer than that of northern cities. The results of our analyses are given in Table I.

The striking feature of the table is that all but four of the samples exceed 1,000,000 bacteria per gram, and, therefore, according to Marxer, nearly all hamburger would have to be condemned. On the basis of the "organoleptic" test practically all the samples would pass muster. It is obvious that the two tests are far from agreeing.

Some of the samples were held until they responded to the Eber or am-

TABLE I.

GIVING BACTERIAL ANALYSES OF MARKET HAMBURGER STEAK.

Sample.	Date.	Organoleptic Test.	Bacteria per gram of meat.	Bacteria exceed 1,000,000.	Bacteria exceed 10,000,000.
1	Nov. 9	Good	3,700,000	+	−
2		Good	470,000	−	−
3	16	Bad	14,900,000	+	+
4	Dec. 7	Good	2,600,000	+	−
5	20	Good	12,600,000	+	+
6		Good	11,800,000	+	+
7	28	Fair	8,500,000	+	−
8	27	Fair	11,800,000	+	+
9		Fair	30,500,000	+	+
10		Good	29,200,000	+	+
11		Good	4,500,000	+	−
12		Good	1,200,000	+	−
13		Fair	21,200,000	+	+
14		Good	17,600,000	+	+
15	Jan. 11	Fair	77,200,000	+	+
16		Good	7,700,000	+	−
17		Good	19,800,000	+	+
18		Good	14,600,000	+	+
19	Feb. 1	Good	11,400,000	+	+
20		Fair	5,500,000	+	−
21		Good	3,100,000	+	−
22		Good	5,300,000	+	−
23		Good	3,400,000	+	−
24		Good	5,500,000	+	−
25		Fair	2,100,000	+	−
26		Good	3,800,000	+	−
27	14	Excellent (fresh)	269,000	−	−
28	15	Fair	770,000	−	−
29		Fair	4,200,000	+	−
30		Fair	3,800,000	+	−
31		Fair	520,000	−	−
32		Good	21,000,000	+	+
33		Fair	88,800,000	+	+
34	July 16	Poor	81,800,000	+	+
35	25	Fair	1,600,000	+	−
36	29	Good	35,000,000	+	+
37		Good	51,000,000	+	+
38		Good	22,000,000	+	+
39		Fair	37,500,000	+	+
40		Poor	28,000,000	+	+
41		Fair	13,700,000	+	+
42		Good	8,000,000	+	−
43		Fair	43,500,000	+	+
44		Good Freezum	3,800,000	+	−

monia test, and then analyzed bacteriologically to determine if possible the bacterial equivalent of this standard. The results are given in Table II:

TABLE II.

GIVING THE NUMBER OF BACTERIA PER GRAM CORRESPONDING TO THE ORGANOLEPTIC AND AMMONIA TESTS.

No.	Organoleptic test.	Ammonia test.	Bacteria per gram.
1	Bad	..	63,600,000
2	Bad	..	30,000,000
3	Bad	..	7,500,000
4	Bad	..	20,000,000
5	Fair	..	2,100,000
6	Fair	..	6,600,000
7	Bad	+	5,000,000
8	Bad	+	15,600,000
9	Bad	+	23,400,000
10	Bad	+	22,300,000
11	Bad	+	25,500,000
12	Bad	+	25,600,000
13	Bad	+	62,500,000
14	Bad	+	525,000,000
15	Bad	+	127,000,000
16	Bad	+	150,000,000
17	Very Bad	+	112,500,000
18	Bad	+	132,500,000
19	Very Bad	+	187,000,000
20	Very Bad	+	187,500,000
21	Very Bad	+	282,500,000
22	Bad (freezum)	+	120,000,000

It should be noted that the first thirteen analyses were of winter samples, while the remaining nine were of summer samples. All the summer samples showed upward of 100,000,000 bacteria per gram, while the winter samples all showed less than this figure. In some of the summer samples ammonia undoubtedly was present some hours before the test was made, but it is also true that in two instances (Nos. 16 and 22) ammonia was slight and was only discovered after repeating the test; No. 22, however, was found to contain sodium sulphite.

If we average the results of all the samples showing ammonia (7 to 22), we have 125,000,000 bacteria as the equivalent of the ammonia test; if we separate the winter (7 to 13) and summer samples (14 to 22), then we have approximately 25,000,000 and 200,000,000 respectively. From the figures

available, it is manifestly impossible to determine a fair bacterial equivalent for the ammonia test. It would also appear that in warm weather, bacterial or enzymic action lags behind bacterial reproduction. If this inference proves to be true, then we have an added difficulty in setting up a bacterial standard for meat. Parenthetically we may ask the question whether a single standard for milk for both winter and summer is really justifiable.

We attempted also to determine the number of bacteria present in hamburger when the organoleptic test would condemn the samples. Table II includes the organoleptic test for spoiled meats. There is no close agreement between the number of bacteria present and the degree of spoiling as judged by this test. Roughly, 25,000,000 bacteria are present in the winter when the nose condemns, and perhaps 200,000,000 in the summer marks the same point. In a general way, the organoleptic and ammonia tests agree, although the latter probably lags behind somewhat.

Comparison of Sanitary Standards for Meat.

If we compare the various standards or tests, we find the following:

1. The Marxer standard of 1,000,000 bacteria per gram as a limit appears to be too low, since nearly all samples af hamburger would be condemned by it, even though they show no taint or evidence of putrefaction otherwise. We have also analyzed samples of other market meats all of which would pass inspection, and have frequently found them to exceed this limit. The same is true regarding some of the samples of poultry analyzed in the Bureau of Chemistry and reported in Bulletin No. 115.

2. The organoleptic and the ammonia tests agree fairly well, although the latter appears to lag behind somewhat. In general these tests appear to be too liberal, for the meat is actually putrid and literally teems with millions of bacteria per gram before it responds to them. It would seem that a stricter standard would be desirable.

3. In view of the above considerations, we would propose a bacterial standard of 10,000,000 per gram as the limit. This is a tremendous rise over Marxer's figure, but on this basis 50 per cent. of our market samples of hamburger would still be condemned. The condemning of so large a proportion of hamburger can be justified on the following grounds: (a) much of it is actually spoiled when it reaches the consumer or is to be cooked; (b) meat teeming with 10,000,000 bacteria per gram is potentially rotten and soon will be actually spoiled under ordinary methods of handling; (c) the fact that markets are prone to add sodium sulphite to hamburger, even though the dealer knows it to be contrary to law, indicates that something is wrong with the hamburger; (d) finally, if hamburger were made from wholesome meat in the first place, then kept properly iced, we believe that the bacterial content could readily be held within the 10,000,000 limit.

REPORT OF A MILK-BORNE EPIDEMIC OF DIPHTHERIA.

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Read before the Laboratory Section, American Public Health Association, Colorado Springs, September, 1913.

In the latter part of April of the present year an unusual number of cases of diphtheria began to be reported in a restricted section of the city of Lincoln. On April 21, nine cases were reported in three families. In one family there were four, in another three, and in the third two cases. On the 22d seven more cases were added and at this time the observation was made that they were all reported from families which obtained their milk from the same dairy. On the 23d an investigation of this dairy was made by City Health Officer, Dr. John F. Spealman.

This investigation disclosed the following facts: On Sunday, April 13, Mr. J. consulted a physician for a sore throat. The physician whom he consulted told him that his throat looked suspicious and suggested that Mr. J. should be seen again on the following day. Mr. J. requested that the physician should not come unless called again. The physician was not called at any subsequent time.

On Tuesday, April 15, Mr. J. began work at the dairy which was shown later to be the source of infection in this epidemic. On April 23, cultures were taken from the throats of both Mr. and Mrs. J. and these showed diphtheria bacilli on April 24. At this time there was no membrane in the throat of Mr. J. In the throat of Mrs. J. there were well-defined patches of membrane on the tonsil and adjacent parts of the pharynx.

Mr. J. confined his activities to the dairy, getting his meals at home. He did not enter the house of the dairyman, his duties not requiring such entrance. He assisted in milking and poured the contents of his pail into a common container where it was mixed with the rest of the output of the dairy. Mr. J. and his wife were at once quarantined and the dairy was ordered to stop selling milk on April 23. This order resulted in the permanent closing of the dairy. Inspection of this dairy showed that it was otherwise excellent from the sanitary standpoint.

The following table, No. I, shows the number of cases of diphtheria reported in days on the milk route of the dairy which was the cause of the outbreak.

The cases reported on May 14, 24 and 26 were not reported when the illness began. The one reported on the 14th gave a history of having had a sore throat for about three weeks. This sore throat had been diagnosed

tonsilitis by the attending physician and was found to have been diphtheria when positive cultures were obtained from his throat on the 14th of May. The two cases reported on May 24 and 26 were in the homes of Christian Scientists and had existed for approximately a month.

In Table No. I has been included one case as being reported on April 24. This case was reported from the death certificate on this date, diphtheria being included in the statement concerning the cause of death. This individual had used the milk from the infected dairy before and during her illness which began about a week before her death. Antitoxin was administered in a dose of 5,000 immunity units when she was practically moribund. Death occurred four hours after the administration of the antitoxin. This was the only death which occurred in those who were treated with antitoxin. In all there were 110 cases in which there was a definite history of the use of milk as a beverage. Not a single death occurred in

TABLE I.

Day of month.	1913. April cases.	Day of month.	1913. May cases.
21	9	3	1
22	8	6	1
23	6	14	1
24	32	24	1
25	14	26	1
26	16		
27	5		5
28	9		
29	2		
30	4		
	105	Total	110

97 who received antitoxin on the first days of their disease. Of the 12 who did not receive antitoxin one died. There were only two deaths resulting from this epidemic, or a death-rate of 1.8 per cent. The case in which antitoxin was not given until the patient was moribund should not be included with those who had antitoxin early. This would make the death-rate 0 among those who received antitoxin. The death-rate in those who did not receive antitoxin was 8.33 per cent. If the patient who did not receive antitoxin until she was moribund were to be regarded as properly belonging to the group which did not receive antitoxin the death-rate for the latter would be 15.4 per cent. In addition it should be stated that the disease was reported as mild in all of those who did not get antitoxin with the exception of the case in which death occurred.

Of the 110 cases which are included in this report 109 revealed diphtheria bacilli. No culture was made in the one instance where death and diagnosis were almost synchronous.

The dairy which supplied the infected area furnished milk to about 15 per cent. of the families living in this section. In all 301 families were supplied, diphtheria developing in 79 of them, a percentage of 26.24. In these 79 families there were 110 cases. There were two cases in 18 families, three in 5 families and four in one family. In this area there occurred during this period only four other cases. These four individuals were reasonably sure that they had not partaken of this milk. Two of the four gave a clear history of intimate contact with individuals who had diphtheria at about the same time. The other two did not give any history of known contact.

In all the rest of the city during this period six cases were reported. Of these two gave a very definite history of contact with diphtheria patients. All of these six individuals were reasonably certain they had not partaken of this milk.

The following table gives the ages of cases arranged according to sex:

Age in years.	Number of cases.			Age in years.	Number of cases.		
	Male.	Female.	Total.		Male.	Female.	Total.
0– 4	4	4	8	40–44	1	2	3
5– 9	6	13	19	45–49	2	4	6
10–14	14	5	19	50–54	0	1	1
15–19	7	3	10	55–59	0	2	2
20–24	7	9	16	60–64	0	1	1
25–29	2	6	8	65–69	0	0	0
30–34	1	5	6	70–74	0	2	2
35–39	2	7	9				
				Total	46	64	110

There occurred in the period 0–24 years in males 38 cases and in females 34 cases. In the period 25–49 years 8 cases occurred in males and after this date none. In the period 25–49 years 24 cases occurred in females. In females there were 6 cases over 50 years of age, one being 72 and another 74.

This epidemic, like milk-borne typhoid fever epidemics, shows the greatest incidence in women and children. This is to be explained in the same way as in typhoid fever, namely, a greater consumption of milk by women and children than by men.

In the 79 families from which diphtheria was reported, there were 337 individuals. Nearly all of these had partaken of the milk from the infected dairy. Of the 337 individuals, 110 had diphtheria or 32.64 per cent.

The severity of the disease in those infected was reported as follows:

Very severe	13
Severe	20
Moderately severe	46
Mild	31
Total	110

This would indicate that the disease in this epidemic was of about the average severity.

The following table shows the number of individuals receiving antitoxin as a therapeutic measure and the number of immunity units administered.

Immunity units.	Number of cases.	Immunity units.	Number of cases.
1,000	4	9,000	2
2,000	2	10,000	7
3,000	21	11,500	1
4,000	5	12,000	1
5,000	29	13,000	1
5,500	1	15,000	3
6,000	3	17,500	2
7,000	3	18,500	1
7,500	1	20,000	1
8,000	5	30,000	2
8,500	1	52,500	1
		Total	97

Thirteen of those who were ill received no antitoxin. The smallest dose given as a curative measure was 1,000 immunity units. This was given four times. Three of the patients receiving this dose were children, one of them being only four and one-half months old. One of the two receiving 30,000 units was very ill. A paralysis affecting the soft palate and the vocal cords developed which lasted nearly two months. The patient who received 52,500 units also had a paralysis which affected the vocal organs. Three weeks after the beginning of her illness there developed a paralysis which affected all the muscles of the trunk and extremities. The alimentary tract was also affected. Incontinence of feces and involuntary vomiting continued for several weeks. The urinary tract was not involved. This patient is now beginning to convalesce but is not yet able to walk.

Of the 227 individuals in the 79 infected families who did not have diphtheria, only 78 received prophylactic doses of antitoxin. Nearly

all of those who received prophylactic doses were children. The amount given varied from 500 to 5,000 immunity units. The majority received 1,000 units.

Rash was present in 26 instances in the 175 to whom antitoxin was administered or in 15 per cent. of those receiving it. It occurred with about equal frequency in both therapeutic and prophylactic adminstration. In one instance there was swelling of the cervical and axillary glands. No other disturbance was recorded in any person who received antitoxin.

In order to obtain an approximate estimate of the loss entailed during this epidemic the following questions were sent out by the Health Office. Replies were obtained from three-fifths of those to whom the questions were addressed. The replies to these letters from the basis for an estimate of the loss sustained by all the families in which the disease existed. The questions were as follows:

What was the expense for antitoxin?
What was the expense for other drugs?
What was the expense for nursing?
What was the expense for medical treatment?
What was the expense for other incidentals?
What was the expense for board of those away from home?
What was the money value for loss of time?
How many days were lost in school?

The figures compiled from these data added to the loss entailed by the closing of two dairies and the extra expense which the epidemic placed upon the Health Department show an approximate economic loss of $10,000. This estimate does not include the loss sustained through the two deaths which occurred.

The early discovery of the source of infection, the prompt closing of the dairy, the release from quarantine after negative cultures were obtained and the early use of antitoxin limited the epidemic and brought it to a quick termination. That its termination was complete is evidenced by the fact that practically no cases of diphtheria have occurred in the city since the middle of May.

A STUDY OF CALCIUM HYPOCHLORITE AS A DISINFECTANT OF WATER.

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A number of different methods of water sterilization have been devised during the last decade or so, but few of them have proved to be commercial successes. The most successful method from a cost efficiency standpoint appears to be the hypochlorite process. Hypochlorites have long been recognized as powerful disinfectants, but it was not until the early nineties that the calcium and sodium compounds were used to any considerable extent as disinfectants of water. This method of sterilization by hypochlorites, however, has been criticised considerably from time to time. It has been claimed that treatment with calcium hypochlorite or chlorid of lime, as it is commonly called, imparts a decided taste and odor of chlorin, and that the hypochlorite remains in the water for a considerable time after application of the "bleach"; also that the hardness is increased; that there is considerable "after growth" of bacteria, and that this growth is objectionable in character. It was in order to obtain data in regard to these points of objection and because of frequent requests received by Dr. M. P. Ravenel, director of the State Hygienic Laboratory, for information in regard to the efficiency of calcium hypochlorite as a disinfectant of water that the experimental work, involving the treatment of waters of various qualities from different parts of the state, was undertaken.

The purpose of using disinfectants is to remove undesirable bacteria from the water, and it is obvious that any method combining the desirable qualities of efficiency and economy would prove of great value in the production of a safe water supply, either as a permanent method of disinfection, or a temporary remedial method, or as an adjunct to filtration. The different substances which have been proposed for use as sterilizing agents are heat, lime, ozone, permanganates, copper and its compounds, and chlorin and its compounds, the hypochlorites.

Still other methods have been devised using hydrogen peroxide, barium peroxide, chlorin dioxide and bromin and chlorin together. These substances effect the necessary sterilization by the action of nascent oxygen, liberated in the presence of organic matter, and have produced very good results; but, because of the expense involved, which is comparatively large, treatment of water with the above mentioned materials has not been extensive.

HYPOCHLORITES.

Hypochlorites have long been recognized as powerful and efficient dis-

infectants. The sodium and potassium salts have not been generally employed on a large scale because of their relatively high cost, but calcium hypochlorite has been rather extensively used. Calcium hypochlorite or chlorid of lime, also known as "bleaching powder," contains from 30 to 40 per cent. of available chlorin. The hypochlorite dissolves in the water leaving a residue, composed mainly of calcium hydrate and calcium carbonate. Many investigators have studied the action of calcium hypochlorite on specific bacteria and the results of numerous experiments conclusively indicate that relatively very small amounts of available chlorin are sufficient to destroy vegetative bacterial life. The disinfecting efficiency is dependent on the amount of organic matter present, the time of exposure, and the concentration of available chlorin in the solution. From an economical view point, a detailed study of results on a cost basis leaves no doubt that the efficiency of calcium hypochlorite is much greater than that of the other germicides mentioned.

Nature of Hypochlorite Process.

This process is essentially one of oxidation, by which objectionable bacteria in water under treatment are destroyed. This compound, commonly spoken of as chlorid of lime, is really a mixed salt of calcium, containing calcium chlorid, calcium hypochlorite, calcium carbonate, calcium hydrate, and a small amount of inert material. The bleach or chlorid of lime dissolves in water, leaving a residue composed chiefly of calcium hydrate and calcium carbonate; the calcium chlorid remains inert and ineffective, and it is the hypochlorite which alone serves as an oxidizing and sterilizing agent.

The dissolved calcium hypochlorite reacts with the free carbonic acid and half bound carbonic acid in the water and there is formed calcium carbonate, and at the same time free oxychlorid, which is known technically as hypochlorous acid. This latter compound is spoken of as an acid, but it is a very weak acid, as is shown by the fact that in the atmosphere the hypochlorite is decomposed by the weak carbonic acid contained in the air, and there is set free hypochlorous acid in a manner corresponding to that which takes place in the treatment of water.

While hypochlorous acid is an extremely weak acid, it is well known to chemists that it is a powerful oxidizing agent. It effects oxidization, in the presence of organic matter, by virtue of the liberation of nascent oxygen in consequence of its instability. It is well to mention that this treatment is in no sense a chlorin treatment such as is sometimes spoken of, and largely because of the use of the same commercial product in bleaching operations. In bleaching, the commercial product is treated with a strong acid which does break up the chemical and release free chlorin. Even free chlorin is not of itself an oxidizing agent, but in the presence of

water it combines with hydrogen and this sets free oxygen in the nascent or atomic state.

The weak carbonic acid in water is entirely incapable of releasing free chlorin; but instead there is produced hypochlorous acid which gives up its oxygen in the presence of organic matter. Hypochlorous acid is not a poison. The chlorin of this compound combines with the alkaline substances of the water, forming principally calcium chlorid.

The reactions in aqueous solutions are as follows:

$2\ CaOCl_2 = Ca(OCl)_2 + CaCl_2$

$Ca(OCl)_2 + H_2CO_3$ (carbonic acid in water) $= CaCO_3 + 2HOCl$

$2HOCl$ + organic matter $= 2HCl + O_2$ (nascent oxygen)

The HCl reacts with the carbonates; forming chlorids.

$2HCl + CaCO_3 = CaCl_2 + H_2O + CO_2$

It is this atomic or nascent oxygen which acts as the disinfectant and produces oxidation.

The principal substances or compounds in water which are capable of oxidation under suitable conditions are those generally spoken of as organic matter. Some of this organic matter is dead, disintegrating or dissolved, and some of it is living organic matter, comprising bacteria, small microorganisms, certain forms of algæ, diatoms and the like.

There are also some mineral compounds in water which may be oxidized under suitable conditions. They are present as nitrogen in the form of nitrites, and iron in the form of ferrous salts. Another compound which is capable of passing into a higher form of oxidation is that of nitrogen as free ammonia, and which exists in water, for the most part, in the form of ammonium carbonate.

In speaking of the treatment of water with chlorid of lime, it should be borne in mind that the quantity of hypochlorite used is very small, not more than a small fraction of one grain to a gallon of water. The significance of these dilutions has considerable importance in properly understanding the process and the merit of its practicability.

It is ordinarily said that dead organic matter is present in water either in a dissolved or suspended form. As regards organic matter in solution, that is an expression which is not clearly understood by most people. For the present purpose, however, it is sufficient to state that a large amount of the so called organic matter, which gives the color or vegetable stain to certain waters, is not truly in solution in the full chemical sense, but, as a matter of fact, is in the colloidal state. This colloidal state is an intermediate one between the true solution and the suspension state. The colloidal particles are in a very fine state of subdivision, and are truly in suspension and not in solution. Generally speaking, organic matter in true solution consumes more readily available chlorin or, a better term would be, potential oxygen, than colloidal or suspended organic matter, other things being equal.

Of the other forms of living organic matter in water, the bacteria are the most significant in this problem. Bacteria from the view point of readiness of oxidation may be divided into two classes. The first of these comprises the normal or vegetative organisms, and probably the majority of bacteria which are ordinarily present in waters belong to this class. It is in this form, the vegetative state, that the bacteria are most readily destroyed by oxidation and other forms of sterilization.

In the second class may be placed the "spore former." When in this condition, the small bacterial cell is surrounded by a thick membrane or sheath, much thicker and more impermeable than the sheath surrounding the ordinary or vegetative cell. The bacteria when in this state are very difficult to destroy by oxidation or other methods of sterilization.

The importance of this bacterial condition is, however, comparatively slight and almost negligible in this case because the specific germs of infectious diseases, such as typhoid fever, Asiatic cholera, etc., do not form spores, and the same is true of B. coli and the majority of bacteria which predominate the intestinal tract of man and domestic animals. Bacteria in the spore form are not entirely killed by calcium hypochlorite in the amounts usually added to water, but the objectional vegetative forms are very susceptible to hypochlorites, and are readily destroyed, as shown by the results of the experimental work tabulated in this paper.

Experimental.

The experimental work is grouped into four divisions: (1) Application of chlorid of lime, that is, determination of the amount of hypochlorite necessary to practically sterilize waters of different quality and varied composition. (2) Determination of the time of disappearance from the waters of the relatively small amounts of hypochlorite used. (3) Determination of the amount of hypochlorite necessary to impart a taste and odor of chlorin. (4) Determination of increased hardness, if any, imparted by small amounts of hypochlorite.

In order to make the study of the efficiency of chlorid of lime as comprehensive as desirable, and to determine the effect of organic and mineral matter on the efficiency of the process, several waters containing different amounts of organic matter and mineral constituents were selected for treatment with hypochlorite. Sewage from one source was also treated.

The waters were the Madison City water, Lake Mendota water, Lake Michigan water, Lake Winnebago water, and Madison sewage.

The first mentioned water is clear, colorless, very hard, and contains only a small amount of organic matter. The second, Lake Mendota water, is quite hard, contains a moderate amount of organic matter, and, although free from odor, possesses more or less turbidity; quite a little organic matter is in suspension as well as in true solution. Lake Michigan water is color-

less and usually free from turbidity (at points 1 to 7 miles from shore) where the samples were collected, only moderately hard, but usually contains a considerable quantity of organic matter. Lake Winnebago water is decidedly colored and slightly turbid, rather soft, but contains a great deal of vegetable organic matter, as the color indicates. The organic matter is mostly in the form of a colloid, intermediate between solution and suspension. It will be noticed that there is a gradual decrease in hardness in the waters selected, while there is a corresponding increase in organic matter. Sewage, of course, contains very much organic matter.

Before subjecting the water to bacteriological examination, a chemical analysis comprising determination of odor, color, turbidity, free ammonia, albuminoid ammonia, nitrites, nitrates, oxygen consumed, alkalinity, and total solids was made in order to determine the approximate amount of organic matter and the quantity of mineral material present. Later, samples of each water and of sewage were taken for the bacteriological work and treated with the different concentrations of hypochlorite shown in the tables; and after contact, usually of one-half hour, gelatin and agar plates were made and dextrose broth tubes inoculated. In order to study the effect of time, determinations were made, in certain cases, of the number of bacteria remaining at the end of ten minutes, one hour, and two hours, respectively; also the effect of temperature on the efficiency of the process was studied in a few instances.

The effect of different concentrations of hypochlorite on bacteria in the Madison City water is shown in Table I. A large number of tests were made with each water over a considerable period of time, but in order to conserve space only a few representative tables will be given in each case.

TABLE I.

DISINFECTION OF MADISON CITY WATER WITH CHLORID OF LIME.

8–29–12. Time of contact: 10 minutes.

	Av. Cl. in p.p.m.	Gel. ct.	Agar ct.	Gas production in dextrose.		
				0.1 c.cm.	1. c.cm.	10. c.cm.
Raw water.....	....	220	25	—	—	—
Treated water.....	0.1	15	5	—	—	—
	0.3	7	3	—	—	—
	0.5	1	1	—	—	—
	0.7	1	0	—	—	—
	1.0	0	1	—	—	—

The rapidity of the action of calcium hypochlorite as a disinfectant of waters relatively low in organic matter, is, as shown in the first table, marked and interesting, and indicates that long periods of contact are unnecessary.

In Table II are given some of the results of a series of experiments made for the purpose of determining the effect of temperature on the efficiency of hypochlorite sterilization of Lake Mendota water. Relatively high concentrations of the hypochlorite were used in these tests in order to get an idea of the approximate amount necessary to actually sterilize the water.

TABLE II.

DISINFECTION OF LAKE MENDOTA WATER WITH CHLORID OF LIME.

8-15-12. Time of treatment: ½ hour. Temp. 21° C.

	Av. Cl. in p.p.m.	Gel. ct.	Agar ct.	Gas production in dextrose.		
				0.1 c.cm.	1. c.cm.	10. c.cm.
Raw water.....	....	8,750	160	+	+	+
Treated water.....	0.1	2,520	9	+	+	+
	0.3	4	5	−	−	+
	0.5	2	2	−	−	−
	0.7	3	5	−	−	−
	1.	1	1	−	−	−
	3.	0	2	−	−	−
	5.	1	1	−	−	−
	7.	2	2	−	−	−
	10.	0	1	−	−	−
	15.	0	1	−	−	−
	25.	0	1	−	−	−
	50.	0	0	−	−	−

The results obtained in this series of experiments indicate that, although the temperature was decidedly different in each case, the reduction in the number of bacteria was about the same; over 99 per cent. of those growing on gelatin, about 96 per cent. of those growing on agar, and most of the gas-forming organisms were destroyed after one-half hour contact, indicating that the efficiency of the process is independent of the temperature.

The large reduction effected with small amounts of the disinfectant is particularly interesting, but it will be noticed that after 99 per cent. of the organisms have been removed, a further small reduction in the number of the remaining bacteria necessitates relatively large quantities of the

hypochlorite; and that to obtain actual sterility, very high concentrations are required. The destruction of gas formers in this case, and in most cases, is higher than the reduction in the number of total organisms, and it is probably safe to assume that the removal of all vegetative pathogenic bacteria will be as nearly perfect as the removal noted in this group. The bacteria which resist the relatively high concentrations are mainly spore-forming organisms of the harmless variety.

A table showing the results of treatment of Lake Michigan water with chlorid of lime for various periods of time is given in Table III.

TABLE III.

DISINFECTION OF LAKE MICHIGAN WATER WITH CHLORID OF LIME.

10-2-12.

Time of treatment.	Gel. count.			Agar count.			Gas production in dextrose.								
	30 m.	1 h.	2 h.	30 m.	1 h.	2 h.	30 m.			1 h.			2 h.		
Raw water....	2,700	2,500	2,800	1,500	1,200	1,700	.1 −	1 +	10 +	.1 −	1 +	10 +	.1 −	1 +	10 +
Treated water Av. Cl. in p.p.m.															
0.1	500	800	1,125	240	80	400	−	−	+	−	−	+	−	−	+
0.3	9	3	2	6	4	2	−	−	−	−	−	−	−	−	−
0.5	2	2	1	5	3	1	−	−	−	−	−	−	−	−	−
0.7	3	1	0	3	2	0	−	−	−	−	−	−	−	−	−
1.	0	3	1	2	1	0	−	−	−	−	−	−	−	−	−
3.	2	0	0	2	2	0	−	−	−	−	−	−	−	−	−
5.	1	1	0	1	1	1	−	−	−	−	−	−	−	−	−
7.	1	1	0	0	0	0	−	−	−	−	−	−	−	−	−
10.	0	0	0	0	1	0	−	−	−	−	−	−	−	−	−

The rapidity of the action of the hypochlorite is again manifested in these tables. It appears that long periods of contact are not required to effect a desirable reduction; the greater part of the disinfection is accomplished within the first ten or fifteen minutes, and the results indicate that one-half hour contact is ample to secure practical sterilization. It will be noticed that when an insufficient amount of hypochlorite, 0.1 p.p.m., is used, as indicated in Table III, a subsequent growth takes place. When, however, sufficient but relatively small quantities of hypochlorite, 0.3–0.5 p.p.m., are applied, a reduction of 95 per cent. of the total bacteria results; but to destroy the remaining 5 per cent. necessitates long periods of contact and high concentrations of chlorid of lime.

The results tabulated in Tables I, II, and III, indicate that the mineral content of a water has very little effect on the efficiency of the disinfectant, and that relatively small amounts are sufficient to give very satisfactory results with colorless waters containing moderate quantities of organic matter and low turbidity.

Tabulation of the results of treatment of a fairly highly colored water, from Lake Winnebago, Oshkosh, containing relatively a large amount of colloid organic matter is shown in Table IV.

TABLE IV.

DISINFECTION OF LAKE WINNEBAGO WATER WITH CHLORID OF LIME

8-15-12. Time of Contact: ½ hour.

	Av. Cl. in p.p.m.	Gel. ct.	Agar ct.	Gas in dextrose broth.		
				0.1 c.cm.	1. c.cm.	10. c.cm.
Raw water.....	....	2,250	480	+	+	+
Treated water.....	0.1	1,500	200	+	+	+
	0.3	1,000	110	−	+	+
	0.5	900	70	−	+	+
	0.7	750	40	−	−	+
	1.0	85	10	−	−	+
	3.	55	9	−	−	−
	5.	25	8	−	−	−
	7.	15	6	−	−	−
	10.	9	4	−	−	−

The above results are representative and similar to the results of many other examinations of this colored water. The fact is clearly shown in this set of tests that the chemical composition of a water, relative to organic matter, has an important influence on the germicidal value of hypochlorite.

Colored waters, such as this one is, containing a comparatively large amount of organic matter, principally in the colloidal form, require relatively much larger quantities of hypochlorite to effect a suitable reduction in the number of bacteria than is necessary to attain a similar reduction in the case of colorless waters, as is indicated by a comparison of the results given in Tables I to IV. A glance at Table IV will show that 1.0 p.p.m. of available chlorin was required to produce desirable results, and 3.0 parts to destroy all gas formers, while only 0.3 to 0.5 p.p.m. of available chlorin was necessary to effect satisfactory disinfection with the clear waters.

The hypochlorite applied is eventually completely consumed by chemical

reaction with the organic matter, and the germicidal action takes place in the interval of time between the addition of the hypochlorite and its final exhaustion by chemical reaction.

The results of several experiments carried on for the purpose of determining the effect of application of chlorid of lime on sewage, which may be regarded as a concentrated solution of organic matter possessing considerable turbidity, conclusively indicate that the amount of hypochlorite necessary for efficient treatment is dependent on the quantity of organic matter present. In general, it may be stated that the amount of organic matter present practically determines the amount of hypochlorite that it is necessary to use in a particular case, and that the normal mineral constituents have practically no effect on the efficiency of the process.

For the purpose of determining the approximate interval of time between the application of chlorid of lime to the various waters, and its complete disappearance by reaction with the organic matter, treated liter samples were tested for hypochlorite from time to time by the starch iodide method.

The plus sign (+) in the table shows that a positive reaction or blue color was obtained, indicating the presence of hypochlorite; the minus sign (−) indicates the absence of color, and shows the period of time after which no hypochlorite could be detected. The results of the tests with the clear artesian Madison City water, containing relatively a very small amount of organic matter, and Lake Mendota, containing a moderate quantity of organic material, are given in Table VI.

TABLE VI.

Av. Cl. in p.p.m.	City water.							Lake Mendota water.						
	1h.	2h.	6h.	8h.	12h.	24h.	48h.	1h.	2h.	6h.	8h.	12h.	24h.	48h.
0.1	−	−	−	−	−	−	−	−	−	−	−	−	−	−
0.3	+	+	−	−	−	−	−	−	−	−	−	−	−	−
0.5	+	+	+	+	−	−	−	+	+	−	−	−	−	−
0.7	+	+	+	+	+	+	−	+	+	−	−	−	−	−
1.0	+	+	+	+	+	+	+	+	+	+	−	−	−	−
3.0	+	+	+	+	+	+	+	+	+	+	+	+	+	−
5.0	+	+	+	+	+	+	+	+	+	+	+	+	+	+

It appears from the above results that the smaller amounts of hypochlorite disappeared from the lake water containing a moderate quantity of organic material within 6 to 8 hours, but similar amounts did not disappear so quickly from the clear artesian city water. The conclusions which

may be drawn from these tests, and similar ones not tabulated, have general applicability and indicate that the small amounts of chlorid of lime—0.1 to 1.0 part per million—which are usually required to effect satisfactory disinfection of fairly clear waters entirely disappear within a few hours after application.

It is frequently claimed that a treated water possesses a taste and odor

TABLE VII.–1.

TREATED CITY WATER.

Containing a Small Amount of Organic Matter.

Av. Cl. in p. p.m.	Taste.						Odor.					
	1 h.	2 h.	6 h.	12 h.	24 h.	48 h.	1 h.	2 h.	6 h.	12 h.	24 h.	48 h.
0.1	–	–	–	–	–	–	–	–	–	–	–	–
0.3	–	–	–	–	–	–	–	–	–	–	–	–
0.5	+	–	–	–	–	–	+	–	–	–	–	–
0.7	+	+	–	–	–	–	+	+	–	–	–	–
1.0	+	+	+	–	–	–	+	+	+	+	+	–
3.0	+	+	+	+	+	–	+	+	+	+	+	+
5.0	+	+	+	+	+	+	+	+	+	+	+	+

TABLE VII.–2.

TREATED LAKE MENDOTA WATER.

Containing a Moderate Amount of Organic Matter.

Av. Cl. in p. p.m.	Taste.						Odor.					
	1 h.	2 h.	6 h.	12 h.	24 h.	48 h.	1 h.	2 h.	6 h.	12 h.	24 h.	48 h.
0.1	–	–	–	–	–	–	–	–	–	–	–	–
0.3	–	–	–	–	–	–	–	–	–	–	–	–
0.5	–	–	–	–	–	–	–	–	–	–	–	–
0.7	–	–	–	–	–	–	–	–	–	–	–	–
1.0	sl.	–	–	–	–	–	sl.	–	–	–	–	–
3.0	+	+	+	–	–	–	+	+	+	+	–	–
0.5	+	+	+	+	+	–	+	+	+	+	+	–

of chlorin, consequently it was thought desirable to make several tests in order to determine whether perceptible taste and odor of chlorin were imparted to the water by the small amounts of hypochlorite generally used to disinfect. For this purpose, liter samples of the different waters were treated with various amounts of chlorid of lime, and several persons were asked to take the odor of and to taste the treated samples at different

periods after treatment. They did not know which contained chlorin, or the amount present. The results are shown in the tables below. The (+) sign indicates that odor and taste of chlorin were perceptible. The (−) sign indicates absence of odor and taste of chlorin.

In the case of treated Lake Michigan water results similar to those of treated Lake Mendota water were obtained, while odor and taste of chlorin were entirely absent from the samples of colored Lake Winnebago water, containing less than three parts per million of available chlorin, a few hours after treatment.

It is interesting to note that the treated samples of Lake Mendota water containing less than one part per million of available chlorin did not possess perceptible taste and odor of chlorin one hour after treatment; and that the taste and odor of chlorin imparted to the treated city water, containing much less organic matter than the lake water, did not disappear so rapidly.

The results of the entire series of experiments along this line indicate rather conclusively that the small quantities of chlorid of lime which are sufficient to practically sterilize waters of fair quality do not impart a lasting taste and odor of chlorin. The imparted taste and odor of chlorin, which is only very slight at any rate in waters containing concentrations of hypochlorite varying from 0.1 part to 1.0 part per million of available chlorin, usually disappears in a few minutes and generally in less than an hour.

A treated water should not only meet all the sanitary requirements of a suitable supply, but it is essential that such a water should be satisfactory from an industrial standpoint as well; in this case the hardness of a water should not be materially increased by treatment with small amounts of chlorid of lime if the process is to be entirely suitable from an industrial viewpoint.

In order to determine whether a material increase in the hardness resulted from the addition of hypochlorite, the hardness of the various waters was first determined by the Clark's soap method, then liter samples of these same waters containing concentrations of available chlorin varying from 0.1 to 5.0 parts per million were prepared, and the hardness of each sample was determined one-half hour after the hypochlorite had been added. In no case was an appreciable increase, as determined by the soap method, detected. These results, therefore, indicate that a water supply may be beneficially treated with small amounts of chlorid of lime without any detrimental effect on the quality of the water for industrial purposes.

It is sometimes claimed that the hypochlorite process is more or less unsatisfactory because of the "after growth" of bacteria; but it does not appear to be quite reasonable to base a condemnatory judgment of this method on such grounds. Secondary or subsequent growths, provided sufficient hypochlorite is used to practically sterilize, have really no sani-

tary significance, and the efficiency of the disinfection from the standpoint of pathogenicity of the water is measured by the maximum reduction, independent of any subsequent increase. It has been shown in the tables that the intestinal bacteria of the vegetative types are particularly susceptible to small amounts of hypochlorite. Pathogenic bacteria are also very sensitive to small quantities of chlorid of lime. The results of a number of experiments made for the purpose of determining the effect of different amounts of hypochlorite on typhoid organisms clearly show that the efficiency of the process is very high, and indicate that pathogenic and intestinal bacteria of the vegetative type are rapidly destroyed by hypochlorite, consequently the remaining bacteria in a treated water which multiply and form the "after growth" are harmless resistant vegetative organisms, or spore formers. The phenomenon of the "resistant" minority is common to all kinds of sterilization, whether it be by heat, cold, chemicals, or other means. Therefore, the practical procedure is to determine the amount of hypochlorite necessary for practical sterilization rather than to attempt the ideal complete sterilization.

In the previously mentioned tests, liter samples of Madison City water were sterilized with steam under pressure, and inoculated with typhoid organisms when cold. The water was seeded quite heavily in order to make the tests as rigorous as desirable. The results indicate that less than 0.5 part per million of available chlorin was sufficient to completely destroy all typhoid bacilli.

For the purposes of ascertaining the nature and extent of the secondary growth which occurs in treated waters during storage, a quantity of Madison City water was inoculated with fecal material and liter samples treated with different concentrations of calcium hypochlorite and subjected to bacteriological examination every twenty-four hours for six days. The water was moderately seeded and represented a rather highly polluted water, containing (by count) approximately 300 B. coli and streptococci per c. cm. and showing gas formation in 0.001 c.cm. in dextrose broth. Treatment with 0.5 part per million of available chlorin for one hour was sufficient to practically sterilize the water, completely destroying all B. coli, streptococci, and gas-forming organisms. The only case of after growth occurred in the sample containing the smallest amount of hypochlorite, but the subsequent multiplication proved to be due, mainly, to the growth of harmless spore-forming organisms; B. coli, streptococci, and gas-forming organisms were entirely absent. These results, and the results of many similar tests, conclusively indicate that there is no after growth of objectional intestinal organisms, and consequently the efficiency of the process of sterilization with hypochlorite, depending only on the destruction of pathogenic and other objectional bacteria and judged by the total removal of organisms, is entirely independent of any subsequent or "after growth."

Summary and Conclusions.

Chemical disinfection offers a means whereby a very satisfactory purification of a water may be accomplished. Comparisons on a cost basis of the methods of chemical disinfection mentioned make it apparent that calcium hypochlorite is the most satisfactory and efficient agent at the present time for water disinfection.

The amount of organic matter in the water practically determines the quantity of calcium hypochlorite that it is necessary to use. As a general rule, practical sterilization may be accomplished by the application of from 0.1 to 1 part per million of available chlorin, but occasionally concentrations of 2 and 3 parts per million of available chlorin are necessary to effect desirable results with rather highly colored and turbid waters.

The removal of B. coli and intestinal organisms is usually more complete than that of the total organisms. Under the conditions of the laboratory experiments, the results of hypochlorite disinfection on typhoid organisms and intestinal bacteria in the various waters were practically identical. It is, therefore, safe to assume that the viability of pathogenic bactera under working conditions in practical water disinfection is no greater than that of the typhoid organism, or intestinal bacteria as a whole. Consequently, the disinfection effected by calcium hypochlorite relative to the total bacterial removal may be referred directly to pathogenic bacteria with assurance of reasonable accuracy.

The slight odor and taste of chlorin imparted when somewhat more than 0.5 part per million is applied disappears in a short time, leaving the water entirely acceptable from a sanitary standpoint; and, as the hardness is not materially increased by the application of the usual small quantities employed, the treated water is not rendered unsuitable for industrial purposes.

There is no apparent reason for believing that the results are not of general applicability. The reactions involved are particularly free from interference on the part of the mineral constituents of normal waters; and normal variations of temperature have practically no effect on the final results. The efficiency of the process is also entirely independent of the secondary or after growth of harmless resistant organisms.

The calcium hypochlorite process of sterilizing water combines the desirable qualities of economy and efficiency, and affords cities and towns, which are unable financially to build a filtration plant, but are forced for sanitary reasons to adopt some method of purification, a means of ensuring a safe water supply. It may be used to advantage in cases of emergency, where either filtered or unfiltered supplies have become infected and where it is difficult to cease using such supplies. Where mechanical filtration is not sufficient to render a water safe, treatment with calcium hypochlorite offers an excellent method of sterilization and is especially applicable in such cases.

Note: I wish to acknowledge my indebtedness to Mr. Carl D. Geidel of the Laboratory staff for his kind assistance in the experimental work.

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SHOULD RURAL SCHOOLS BE CLOSED?

In so vast a country as this, composed of units with mixed populations in different surroundings and with varied interests, it is manifestly impossible to demand uniform laws and regulations. "States' Rights" has therefore since the beginning been recognized as a principle which must permit local care of purely local affairs. In health matters, there are some items of universal necessity, and more and more there has been the demand that uniform methods in vital statistics be established. The need of some such items, important everywhere, has focused attention on uniformity; and may not the tendency now be towards trying to establish methods suitable to one locality yet unfit in another? An important question of

the kind would appear to be whether schools should be closed during outbreaks of communicable disease.

In his able paper on the subject, Dr. F. G. Curtis has argued that the public schools, under good systems of medical inspection, form one of the most efficient organizations for prevention. Reasonably well guarded at all times and with closest scrutiny when danger is suspected, the school children are under excellent supervision. The value of this scrutiny may depend upon some factors outside health work, such as whether it is the health department or the school committee that looks after the condition of the scholars, but if there are deficiencies here they are of administration and not of principle.

School keeps the young people under supervision and in hygienic environment for a number of hours a day. There is reason to believe that but little infection is distributed and that it takes the lines of less resistance, the street play and home hours. Closing city schools turns the children practically into the street for all the time and in reality increases the chance of infection. But this is in the well-guarded city; to what extent is the policy a proper one for rural schools?

It stands to reason that the health officials of the village are not so well fitted for the kind of action that an outbreak of infection demands. Too often the health work is the part-time duty of the health officer, who must have his private practice or starve, for the scanty salary will not support him. Any outbreak therefore appeals to him first as a physician. It calls upon his time, and takes his professional attention and just when there is most need of him as health officer he is in greatest demand as a doctor. Half a dozen Massachusetts towns have recently demonstrated the truth of this and the State has come in to define and work out the situation. Under circumstances like these may not the closing of the schools be the proper course?

In the country the children come to school from widely separated homes. They live in little scattered groups whose members should be quite free from risk from the outside. The school brings them together. At their homes they do not gather in great groups on the streets. The situation is radically different from the city, and it would seem that the greater contact is in the school.

The rural school would be of less consequence as a focus, were a system of adequate inspection possible. But here again is a weak spot in rural health administration; good school inspection is costly and in the country it is difficult to maintain of standard quality.

Under these circumstances and till the efficiency of rural health work can be maintained at a high standard, may it not be well to recognize a differing environment and allow that schools and churches, even, in Massachusetts may be closed in times of serious outbreaks as a measure for the protection of the people?

VITAL STATISTICS AND THEIR NEGLECT.

Since the issue of the last JOURNAL, the office of vital statistician to the Boston Health Department has been abolished and re-established. The municipality has to congratulate itself on the quickness with which the authorities rectified what would have been a grievous error. But the incident is valuable in pointing out how slowly the importance of vital statistics is coming into recognition.

Despite the fact that public health work has advanced wonderfully, it remains true that the foundation of all progressive health work, the figures of population, morbidity and mortality are almost everywhere deficient. There is hardly an investigation that one can make that does not meet with this difficulty. Lack of standardization, lack of definite figures and lack of public interest contribute, each of them, to the unfortunate situation.

Those movements in the interest of health that are spectacular, those which lend themselves to a breezy story of progress, or those which lie in obvious benefits to business, find enormous support and are rushed to perfection, often to the detriment of more important health factors. But neglect of the fundamental principles is the way of the world. The hero who jumps into the water to rescue some unfortunate is awarded a Carnegie medal, but if he should seize the unfortunate before he falls from the wharf, his more meritorious action of prevention would attract no notice.

Prevention is and always will be an up-hill struggle, because it lacks dramatic action. People would rather swat flies than clean the garbage pail. The public prefers the spectacular fire-fighting with all that it means in loss, to quiet life in fireproof towns. So prevention must be founded on an improved education of the people. Prevention must furthermore depend upon figures, for it cannot be carried on without knowing what there is to prevent and how much. Vital statistics tell what the health failings of the community are, what rocks there may be in the channel. There is no other way in which this may be learned. The better the statistics, the more certain will be the value of preventive measures.

It is true that much of sickness is in outbreaks, and that in outbreaks the injury may be done before the symptoms are noted. But here exact figures are of greatest consequence. They serve to locate danger zones, they may mark waves of incidence and give time for preparation if not for valid prevention.

The crying need today in health administration is for a better appreciation of the place of vital statistics, education on the part of the people and closer attention on the part of the physicians, who are videttes in the health army, catching their individual portions of the fight and transmitting these to headquarters where they may be collated and the plans for defense determined. The health administration of a community cannot long be maintained much above the point where public education will support it, and the physicians, coming into contact with the families of the sick as they do, must be the strong force needed for the advance in public education.

MODERN METHODS OF FIGHTING THE HOUSE-FLY

ERNEST C. LEVY, M. D.,
Chief Health Officer, Richmond, Va.

Read before the General Sessions, American Public Health Association, Colorado Springs, September, 1913.

You have all heard of the temperance lecturer who was to give a talk on the Demon Rum in a country town. The morning paper next day stated that, while the lecture was not given, it was nevertheless apparent to everyone in the audience that the speaker was full of his subject. This lecturer has nothing on me; for in the present instance not only the speaker but also all who are here present are simply covered with my subject. So I am assured of your interest from the start.

Extermination of the house-fly is one of our really important health measures. It is not necessary to go into proof of this today. Every health officer who has studied this question actively in the field, and not just written about it in his office or dabbled a little with it in the laboratory, is convinced that the house-fly is a very active agent in the dissemination of disease. I am going to assume that we all understand this. Moreover, it is surely fair to assume that, in many a case of illness not itself caused by flies, the delicately poised balance between life and death may well be turned by the annoyance and loss of rest brought about by this pestiferous insect. Still again, there is abundant reason why everyone of us in attendance on this meeting would like to see *Musca domestica*, and all allied species and genera, wiped off the face of the earth, or at least from that wonderful and otherwise perfect corner of it on which we are now assembled.

I think that up to even a year ago most of us felt that we were engaged in a hopeless kind of fight. We felt that we could of course do a great deal, but that in spite of killing millions of flies and doing our utmost to limit the breeding of this insect, yet their tremendous prolificness—the mere brute force of their numbers—would still get the better of our ingenuity.

This is not true today. The fight against the fly is a winning fight. We now have the necessary knowledge and the necessary machinery. To make these effective, however, we need the same old thing that we need in all public health work—the coöperation of the people. This, in turn, must be preceded by education of the people.

The evolution of our work for the extermination of the fly has been somewhat slow—slow at least for these days. But we have today methods

which are perfectly capable of wiping out the fly in any community within a very short time, provided always that the people understand and are ready to help us. More than this, if coöperation of all the people cannot be secured, we know how to eliminate the fly almost completely in any limited section of a city in which the local residents are sufficiently interested to carry on that part of the work which is assigned to them.

In order to fight flies successfully, we must fight them at every stage of their development. This means the keeping apart of flies and all material (especially horse manure) suitable for the depositing of their eggs; the removal, or destruction, of fly-blown material before the eggs have had time to develop into flies or into mature maggots, and the destruction of adult flies by all known means.

It is useless to expect results of a satisfactory nature if any single thing is neglected. Fly-swatting campaigns, for example, kill relatively few flies, even though the actual number killed may go into the millions. Nevertheless, fly-swatting has a decided field of usefulness, in that by this means we get rid of flies which are not reached by other methods, and which will multiply many hundredfold unless destroyed. To claim that fly-swatting is useless because only a few million flies are killed, or that it is worse than useless because these flies should never have been allowed to hatch, is altogether wrong. The life cycle of the fly is so short, from egg to egg, from maggot to maggot, from pupa to pupa, or from fly to fly, that each point precedes every other point as well as follows it. Those who contend that killing adult flies is the wrong way to proceed, because we should have prevented these flies from ever hatching out, fail to realize that the killing of a few adult flies of a previous generation would have gone really further back than merely preventing these flies from depositing their eggs in a favorable place.

The literal swatting of flies does not, of course, get rid of any very great number of these nuisances, but in all fly-swatting campaigns dead flies are counted regardless of how they were obtained, and hence the term "fly-swatting" is frequently used as essentially synonymous with the killing of adult flies by any method whatever.

For killing large numbers of adult flies no method is so productive of results as the use of traps. By this I do not mean the small fly traps sold for about 15 cents at hardware stores, and used about the house. Such traps are not found by the flies for a long time, and even then the number which such traps get rid of is relatively small. There are today in use traps of another kind—large affairs about two feet tall and fifteen inches in diameter. These traps are of very stout construction. They are built on the same principle as the smaller traps, but the cone ends in an opening which will admit one's thumb. The flies which once get through this opening and into the trap proper never find their way out again.

These traps are, therefore, not only useful on account of the tremendous number of flies which they catch, but, speaking from my personal experience, they are encouraging. When one sees flies by the thousand walking and flying about over every fraction of a square inch in such a trap without ever finding the large opening by which they entered, and out of which they could get with equal ease, one cannot fail to feel that it would be a disgrace to admit that an insect with so little sense could outwit man.

These large modern fly traps are not placed indoors, but in the case of residences they are placed in the back yard, and in the case of stores they are placed in the street near the curbstone. The manufacturers of this trap lay great stress on the rôle played by the bait which accompanies each trap. One or two drops of this bait are placed in a saucer of vinegar and put under the trap. The manufacturers claim that the bait so prepared will attract flies from a great distance, even from a kitchen in which a meal is cooking.

My own trap was built by myself at a cost of about 50 cents, and I did not find it necessary to employ any especially manufactured bait. A saucer of vinegar with a liberal sprinkling of sugar around it was in every way successful. Stale beer worked equally well. This trap caught many things besides house-flies. In fact, there was, roughly speaking, about one fly of some other kind to every two or three house-flies. These other flies were green ones and blue ones and gray ones, large and small, but the house-fly was always in evidence, outnumbering all other kinds put together. In addition to flies, my own trap caught regularly large numbers of June bugs, and at one period tremendous numbers of moths about the size of the last joint of one's thumb. Bees and wasps were also caught in considerable numbers. During the summer this one trap caught over three quarters of a million flies, calculated on a basis of 13,000 to a quart.

It can hardly be contended that even one such trap on a city block has no effect on the number of flies prevalent in that block, even though nothing else be done. In my own case, a neighbor living about ten doors from me was hatching flies throughout the summer at a far greater rate than I could catch them. Even under such circumstances, the number of flies on my block must have been lessened not merely by the 750,000 which I actually caught, but by numbers far greater than this, since the flies trapped early in the season would probably have multiplied at least a thousandfold before the end of the season.

After we get complete control over all breeding places, this special kind of trap will probably no longer play a prominent rôle, since it is not effective in dealing with the smaller residual numbers with which we will then have to deal. For this latter purpose smaller traps, tanglefoot paper, poisons and swatting will meet the situation.

These large fly traps have another distinct field of usefulness, as illus-

trated by the following case: A mile or so outside of Richmond there is a very attractive suburban community. From all that I have ever been able to see, there are few, if any, horses kept in this community, and all the lots are apparently free from any large collections of material which would serve as breeding places for flies. But regularly each year this community is literally overrun with flies. It is no exaggeration to state that I have seen at least one tenth of the surface on railings and pillars of porches occupied by flies. Where they come from I have never been able to determine. It is true that I have never made a thorough investigation, but there is no section of Richmond where I have ever seen flies as prevalent as they are in this suburb. Of course, these flies breed somewhere, either within or without the boundaries of this suburb, and an investigation would ultimately determine where. Pending this, however, it would be entirely practicable for this community to reduce the number of flies to a small percentage of their present numbers if each householder would use even one of these traps and look after it properly.

It seems to me that there is room for good work in determining what is the best bait to be used in traps of this kind. It would be desirable to find a bait which would attract flies but not moths, June bugs, wasps, bees, etc., since these insects consume the sugar far more rapidly than do flies, and thus necessitate more frequent rebaiting, besides which there are obvious personal objections to dealing with a trap in which the two insects last mentioned are present.

I shall not discuss at length the very important questions of stable construction and removal of manure. It is useless to expect very good results unless these things are properly looked out for. I am inclined to believe that the statement that 90 per cent. of all house-flies in cities breed in horse manure is far below the mark, and that very small numbers breed in any other material. Even though this be so, we must nevertheless believe that in a community in which there are no horses, or in which all horse manure is so perfectly handled that it never becomes accessible to flies, house-flies would deposit their eggs in other organic matter, if such were available. In fact, I frequently found during last summer large numbers of fly eggs laid on the bare wire of my large fly trap. Whether these were the eggs of the house-fly or of one of the other 57 varieties I am unable to state, but it would appear from this as if the female fly is unable to retain mature eggs beyond a certain point, but must deposit them somewhere.

Stable floors should by all means be of tight construction. I have frequently seen maggots disappearing in cracks less than one eighth of an inch wide between wooden blocks in a stall. Whether or not such maggots pupate, and whether or not they could ever emerge as adult flies, is another question which I have not had time to look into.

Recent experiments conducted by the Richmond Health Department have caused me to hold views quite different from those generally accepted in regard to stable construction and removal of manure. These experiments have been told briefly in a paper published a few months ago.[1] They convinced me that the house-fly does not normally enter the pupa stage in manure if the adult maggots find it easy to leave the manure and enter the earth. Since the paper above mentioned was written, additional experiments have been conducted by us. I will relate one of these briefly. Two wooden soap boxes, about two feet long and one and a half feet wide and nine inches deep were used in this experiment. In one of these boxes was placed fresh horse manure. This was supported on wire gauze with a mesh of about one half an inch, the bottom of this box having been first knocked off. This box was placed on top of a second one of exactly the same kind. This lower box was first filled with dry earth. The two boxes thus arranged were placed near a stable. At the end of 24 hours the manure in the upper box was loaded with eggs of the house-fly. Fine wire gauze was then nailed over the top of the upper box. The manure, meanwhile, had settled down so as to leave a space of about one inch between the upper surface of the manure and the fine wire gauze. Maggots developed promptly, but three days after the beginning of the experiment all the maggots had apparently left the manure box. Examination of the lower box at this time showed it to be swarming with large maggots. We then separated the two boxes and screened the lower one, which, to repeat, contained finely divided earth. We got thousands of flies from the box of earth, but not one from the box of manure, nor did careful examination of this manure show a single maggot or pupa. In other words, every maggot had left the manure and gone into the earth.

Our experiment went even further than this. The wooden bottom of the lower box (the one containing the earth had in it several small holes and cracks which we had failed to notice. Not only did all the maggots go through the nine inches of manure in order to get to the earth in the lower box, but a very considerable number of them continued on down through the nine inches of earth in the lower box, and then got out of this box through the holes and cracks above mentioned, as was shown by the fact that we found in the earth immediately under this box, and for several feet around it, maggots and pupæ. This experiment surely sustains our point—namely, that the house-fly does not normally pupate in manure but in earth.

The facts just discussed have an exceedingly important practical bearing in connection with fly-fighting work. It has heretofore been held that if all manure is removed from a city at intervals shorter than the minimum time in which the eggs of the house-fly can develop into adult

[1]Am. Jour. Public Health, Vol. 3, No. 7.

flies, flies will not hatch from this manure while it is in the city. According to Howard, the minimum time from egg to fly is eight days, so that heretofore weekly removals of manure have been considered sufficient. It is obvious, however, that if manure stands on the ground, or is placed in receptacles which have in them even very small openings, fly breeding will take place freely, even though the manure is removed at intervals of four days, since three days have been shown to be ample for the development of eggs into maggots of such stage that they leave the manure and enter the earth, if there is any means available for them to do so. We believe, indeed, that large numbers will leave the manure in two days and successfully go through the remaining stages of development in the earth. We must, then, do one of four things: (1) remove all manure from the city every day, (2) store it in absolutely tight receptacles, (3) provide the means whereby maggots which leave the manure box through cracks or holes will fall into some tight receptacle in their efforts to reach the earth, or (4) store the manure in a receptacle especially designed to encourage the maggots to leave the manure and catch them as they do so.

One of our great needs in fighting the house-fly is some substance which will effectively kill eggs, maggots and pupæ of the house-fly. While many substances have been recommended for this purpose, I have not yet found any which was really efficient. Such a substance must be cheap, it must penetrate the manure to a considerable depth, it should not be poisonous to human beings, or especially offensive to them, and it should not interfere with the fertilizing value of the manure, while at the same time it must kill eggs, larvæ and pupæ. The discovery of such a substance would be of tremendous value.

Even though we know of no substance which will fulfill all the indications just mentioned, the use of a fly repellant has considerable value. In any community in which flies are prevalent, we may assume that horse manure becomes fly-blown in stables within a very short time after it is dropped. Frequent spraying of the droppings with some coal tar product will accomplish a good deal in the way of limiting the number of eggs which are deposited in manure in the stable between periods of removal to a proper receptacle. The screening of horse stables is also desirable from this standpoint. Windows offer little difficulty, but screening the doors of large livery stables is scarcely practicable.

Horse droppings on the streets are of no importance in fly breeding. There are many reasons for this, but most of them are self-evident, and hence will not be entered into.

In any campaign against the house-fly it is of the utmost importance that food supplies should be made inaccessible to as great an extent as possible. This constitutes one good reason for having covered garbage pails, even if garbage is not a suitable place for the breeding of the house-

fly. In spite of all that can be done, it is scarcely likely that any fly will actually perish for lack of food in any of our cities, hence the chief reason for limiting the amount of food to which they have ready access is that this measure will increase the efficiency of our fly traps.

In spite of the length of this paper, there are a number of minor points which I have of necessity failed to touch on. These are for the most part points which are so generally understood that this paper loses nothing by omitting them.

In closing I wish to repeat what I said in opening—that our methods of fighting the house-fly are today sufficiently well developed to enable us to accomplish the extermination of flies in any community in which these measures are diligently applied, and even to exterminate them in limited sections of a community provided the entire community cannot be sufficiently interested to attack the problem.

Discussion.

Dr. C. E. Terry: I heartily agree, for the most part, with everything that Doctor Levy has said. I think, as he has stated, that we have been neglecting the soil around manure piles and manure bins very needlessly and with very bad results in lessening the amount of fly-breeding in these places. We found at Jacksonville that in dirt floor stables the flies' larvæ would leave the manure shortly after hatching from the egg and go into the floor of the stable and would there pupate. The manure was scraped up or swept up and the maggots that were an inch and a half or two inches deep in the soil, getting all the nutriment they require from the dirt in which they were living, went on and pupated and hatched the flies, and the daily cleaning of those stables in no wise interfered with the fly-breeding which was caused by the dirt floors. Doctor Levy wrote me about this fly-trap and we tried it. We manufactured one according to his directions, took a barrel, bored 35 or 40 holes in the bottom, and put it up on a tub of water. We screened the top and left about a 6-inch chamber in the top to see if by any chance any of these larvæ were going to pupate in the manure, in spite of the fact that Doctor Levy stated they undoubtedly preferred the sand for that purpose. We, in our first experiment, filled the manure barrel in about four days, filling it as it would be filled in use by the stable owner. I did not succeed in counting the larvæ or the flies in that experiment, for the reason that the larvæ decomposed. I had not thought to put any preservative in the tub and the ants got hold of the flies, but we had a large crop of flies, as far as we could tell, a great many more flies at the top than larvæ below. In the second experiment we put a preservative in the water below to keep the maggots from decomposing and arranged a small fly-trap on top of our screen at the top of the barrel, so that we could receive the flies without difficulty

and keep them away from the ants, and that experiment gave us 11,880 maggots and 3,778 flies. In other words, the receptacle, as we worked it, and we used it exactly as described by Doctor Levy, was about 75 per cent. efficient. It occurred to me, in that connection, however, that flies will not naturally burrow; their natural inclination is to go up. In the paper that I read in Havana two years ago I reported raising flies through 48 inches of sand, buried as larvæ or as eggs, and recovering from them organisms like larvæ, and the inclination of the fly, I still believe, is to go up,—I mean the inclination of the maggot is to go up. I believe, however, that if the depth of this manure receptacle is shallow, 6 or 8 inches, that in the first layer of the manure placed in that receptacle you will get nearly 100 per cent. of larvæ through the bottom; and in the second 6 or 8 inches, I believe you will get considerably less, and in the later portions added to that manure barrel I think you will get comparatively few of the larvæ out through the bottom. In the third experiment made we acted on that principle and placed in the bottom of our receptacle old manure, comparatively free from larvæ or eggs. In the upper part, or third, of the barrel, we placed manure which contained a great many larvæ and eggs. The figures of that experiment reversed the figures from the first. We secured from that third barrel 680 larvæ and 1,380 flies, and I believe that the apparatus will probably range from 30 per cent. to 75 per cent. efficient, judging from our own results. We have not run enough of them to state definitely yet to that effect. However, the matter is one that should be thoroughly investigated and it may be possible to put it to good use in fighting the fly. I believe, though, it is a rather cumbersome proposition for the average stable owner. I cannot imagine our negro hack drivers caring for a receptacle of that kind, keeping water in the bottom to kill the larvæ. If they do they have got to keep it so it won't crack, which means a galvanized receptacle, and I doubt very much if this new weapon is going to give the results that Doctor Levy promises. However, I hope he may be right. I have made a short review of the situation as it appears to me, which I will read, with your indulgence.

In the newer sanitation
There is nothing in creation
That arouses consternation
  Quite as easily as the fly.
He is found in every city,
In each health department ditty
And, as maggot, more's the pity,
  He will get us when we die.

You will find him in the stable,
Round the privy, on your table,
Or wherever he is able
  To get a bite to eat;

In the hut and home palatial,
From the torrid to the glacial,
Nor does suiciding racial
  Offer hope of his defeat.

We have tried all kinds of trapping,
But have never caught him napping,
And our hopes were slowly sapping
When from a barrel crack'd
Levy saw the larvæ flowing
To the ground, a fly crop sowing,
And an idea started growing
  From this biologic fact.

In his eye there came a gleaming
As he saw those maggots streaming:
All his life he had been dreaming
  Of his chance and it was here!
So he searched through the manure,
From the bottom up were fewer
Of the maggots,—oh the lure
  Of the earth was very clear.

Then and there was born invention
Of a barrel, for detention
Of manure, with the intention
  To let the maggots through,
And below in poisoned water,
Would they beg in vain for quarter
While Levy watched the slaughter
  In a way entirely new.

While the bottom he was watching
From the top were pupæ hatching,
That Levy was not catching,
  But he's got the beggars scared,
We may learn at some time later,
Of new biologic data
From the maggot-trap creator
  That at present we are spared.

DR. E. C. LEVY:

There is really very little for me to add in closing this discussion, except to reply to the objections raised by Doctor Terry. I am really surprised that he should undertake to question the principle on which the maggot trap has been evolved, when by his own admission he has undertaken but three experiments, the first of which was defective, and the last of which he did not himself complete. Even in these experiments he found that a large number of maggots left the manure, although, if subsequent experiments confirm his results, the number of flies which hatched from maggots

which remained in the manure was too large to make the maggot trap as valuable as I believe it to be.

As stated in my paper, we have conducted many experiments in Richmond—quite a number since Mr. Tuck and I wrote our paper on the maggot trap. In only one instance did we get over 100 flies from the top of the barrel, while in every case we got many thousand maggots from the bottom. In our first three experiments we relied on examination of the manure for any maggots, pupæ, or pupæ cases, but failed to find any in a single instance. Undoubtedly, screening the top of the barrel, as suggested by Doctor Terry, is a far better method, and is the one which we have followed in our subsequent experiments. We have tried to make this top screen somewhat dome-shaped, and have placed a small fly trap over a hole which we have made at the highest point of the dome. This makes it far easier to count the flies.

In order to judge of the possible error in the first three experiments, we tried the two methods. In the case in which we got 650 flies from the top of the barrel, the manure was searched at the end of two weeks, and we found about 600 pupæ and pupæ cases. In the case in which we got 55 flies from top trap, 15 pupæ cases were found without difficulty in the upper part of the manure. On another occasion I added 20 pupæ to a large shovelful of manure which was otherwise free of them. Without any difficulty whatsoever 15 of these were recovered, and a more diligent search brought to light 3 more, or 90 per cent. of the small number which was present. These last mentioned facts indicate beyond doubt that if any considerable number of maggots had remained in the manure in our earliest experiments, the very careful search which we made for them could not have failed to reveal a considerable number of pupæ or pupæ cases, while, as a matter of fact, not a single one was found in any instance.

It is entirely conceivable that the maggot trap may not be equally applicable in all sections of the country. There are many hypotheses which might explain such differences, if such differences are found actually to exist. For example, in a section in which a sandy soil prevails, the delicate skin of the maggot may be harmed by penetrating such soil. If this be true, the maggots in such section would do better to risk the vicissitudes of remaining in the manure, and they would have received such an impress through many generations that they would not leave the manure even though, in a special instance, there was placed under it soil which was not injurious to them. In other words, maggots in such a section would have lost, or failed to acquire, the habit of leaving the manure, even though given abundant opportunity to do so. I can only say that all our experiments in Richmond have shown that with us the soil is the natural place for pupation of the house-fly, and that unless this be recognized we will fail to eliminate flies.

Many more experiments must be conducted before we will know a number of points of considerable interest in this connection, but I wish to bring before the Association the above facts, in order that all of us may take advantage of them from now on.

I wish to add just a word in connection with the maggot trap. In our Richmond work I have never seen any maggots in the actual act of leaving the manure barrel and dropping into the receptacle under it, although, at one time or another, I have watched perhaps a full hour to see them do so. Although we caught thousands of maggots a day, we always found the entire "catch" of each day when we first went to the trap in the morning. These maggots we then removed, in a number of our experiments, and each evening the receptacle was found to be either empty or else to contain only a few straggling maggots. Next morning, however, thousands of maggots were found, and this continued up to the time that the manure had become free of them. Apparently the maggots, under the conditions of our typical maggot trap and when this trap is out of doors, leave the manure only at night. This suggests a number of points, some of which we have already followed up but none of which I can discuss in the limited time at my disposal. However, in one of the three original observations which first suggested to us the principle of the maggot trap, a steady stream of maggots was leaving the manure, hour after hour, during the daylight hours. Conditions in this case were quite different from those in our typical maggot trap.

While I have undertaken to reply to Doctor Terry's scientific objections, I realize that I have not yet replied to him adequately. He took a somewhat unfair advantage of me when he sprung his most excellent poetical criticism. I enjoyed this as much as the rest of you. Doctor Terry favored me with a copy of his verses on yesterday, so my time for a reply to these has been short. However, in closing let me say:

My dear Doctor Terry, 'tis interesting, very,
  To know that your maggots decline
To leave the manure, and find death that's sure,
  In your trap as they do in mine.

'Tis truly distressing, and you had me guessing,
  Until the real reason I found—
To Virginia's soil even maggots will toil,
  But prefer dung to Florida ground!

A NEW SHIPPING OUTFIT FOR ICED WATER SAMPLES.

FREDERICK H. BILLINGS and C. C. YOUNG.

Read before the Laboratory Section, American Public Health Association Colorado Springs, September 9-13, 1913.

The portable refrigerator and sample bottles shown in the accompanying illustrations were designed to meet the conditions incident to shipping samples long distances to the Kansas State Water Survey Laboratory and to conform to the requirements of the Standard Methods, American Public Health Association.

Pressed ground cork is the insulating material used in these containers and it is moulded in one piece. The inside lining is eight ounce tinned copper seamed and soldered. The outside protective covering is twenty-eight gauge galvanized iron. The copper box that carries the sample bottles is provided with a movable partition so that one, two three or four samples may be shipped safely. The box is suspended from the lid of the refrigerator by two hooks and a catch. When the catch is closed and the lid fastened in place, it is impossible for the catch to come unfastened until the lid is removed.

The bottles are held snugly in place in the upper portion of the container. The space below is large enough to hold six or seven pounds of ice. The outside dimensions of the refrigerator are sixteen inches high and twelve inches in diameter. The inside dimensions are twelve inches in depth and eight inches in diameter. The weight without ice or water samples is seventeen pounds. Packed for shipment with four samples, the case weighs twenty-four pounds, thereby coming under the thirty-cent limit of express tariff "K."

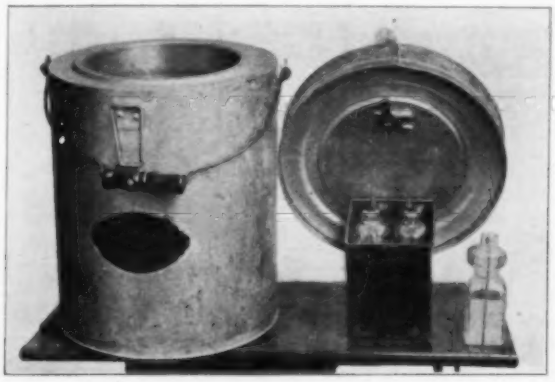
In case this container should be tipped over in shipment, there is sufficient space so that the water from the melted ice will not come in contact with the sample bottles.

One of these refrigerators was placed in a 37° incubator, and it was found that six pounds of ice would keep samples under 10° for thirty-four to thirty-six hours, depending on the size of the pieces of ice used in packing.

The sample bottle holds six ounces. One face is ground so that the description of the sample can be written on the bottle. The top of the ground space serves as a graduation for four ounces of water, thus allowing for an air space above the sample. The stoppers and bottles are numbered and each stopper is ground to fit.

The special feature of this bottle is the design of the stopper. The stopper proper is partially protected by an overhanging hood. The hood,

however, has for its chief purpose the protection of the neck of the bottle. The handle is notched to hold a strong rubber band and is heavy enough so that if the stopper is laid down, the portions coming in contact with



the water will be held away from the surface on which the stopper is placed.

Twelve dozen of these bottles have been in use three months. In that time only six have been broken in sterilizing, two in shipment and four in collecting samples. In practice the bottles are washed with chromic acid

cleaning mixture, rinsed, dried, and then sterilized in a dry oven at 180° to 200° C. for an hour.

Fifty of these outfits are in constant use by the laboratory at present.

Date.	City.	Distance from Lawrence.	Hours en route.	Maximum temp. at Lawrence.	Condition on arrival.
June 5	Marysville	134*	48	90.2° F.	Below 10° C.
5	Hutchinson	194	24	90.2	Below 10° C.
5	McFarland	53*	48	90.2	Below 10° C.
7	Burlington	73*	48	76	Above 10° C.
10	Excelsior Springs	55*	20	75	Ice.
11	Manhattan	80	20	80	Ice.
13	Concordia	171*	48	83	Below 10° C.
16	Bonner Springs	22	10	93	Ice.
17	Clearwater	219*	46	94	Below 10° C.
18	Marysville	134*	12	102	Ice.
24	Ottawa	27	10	93	Ice.
July 1	Chanute	161*	36	87	Below 10° C.
2	Medicine Lodge	296*	24	91	Below 10° C.
3	Norton	292*	34	94	Above 10° C.
3	Piqua	154*	24	94	Below 10° C.
9	Leavenworth	34	24	92.5	Below 10° C.
11	Dodge City	327	24	96	Ice.
12	Lucas	203*	24	91.5	Below 10° C.
12	Lebanon	207*	64	91.5	Above 10° C.
15	Holton	50*	24	103	Ice.
15	Marysville	134*	24	103	Ice.
15	Kingman	227*	24	103	Ice.
16	Wilsey	89*	36	102.5	Above 10° C.
17	Atchison	71*	48	101.5	Above 10° C.
17	Burlington	73*	24	101.5	Below 10° C.
19	Pratt	267*	48	88	Above 10° C.
21	Ottawa	27	10	86	Ice.
22	Neodesha	196	26	85	Ice.
23	Paola	82*	24	92	Ice.
23	Great Bend	244	24	92	Ice.
24	Pittsburgh	216*	24	81.5	Ice.
24	Humboldt, Nebr.	177*	24	81.5	Below 10° C.
24	Cherokee	175*	48	81.5	Below 10° C.
24	Mankato	198*	48	81.5	Below 10° C.
24	Iola	95*	24	81.5	Below 10° C.
24	Larned	267	24	81.5	Ice.
24	Russell	224	24	85	Ice.
25	Wichita	187	24	85	Ice.
25	Osawatomie	100*	24	85	Ice.
26	El Dorado	163*	24	96	Ice.
28	Winfield	217*	24	95.5	Ice.
30	Caldwell	234*	48	100.5	Below 10° C.
30	Chanute	161*	24	100.5	Below 10° C.
30	Lansing	39*	16	100.5	Ice.
30	Burr Oak	271*	28	100.5	Ice.
30	Almena	282*	24	100.5	Ice.
31	Syracuse	429	24	87	Ice.
31	Onaga	58*	24	87	Ice.
31	Olathe	58*	24	87	Ice.
31	Florence	132	24	87	Ice.
31	Baileyville	184*	24	87	Ice.
31	Waterville	170*	72	87	Above 10° C.
31	Oswego	191*	24	87	Ice.

Date	City	Distance from Lawrence	Hours en route	Maximum temp. at Lawrence.	Condition on arrival
Aug. 4	Atchison	71*	36	103.5° F.	Below 10° C.
5	Topeka	27	8	104.5	Ice.
5	Burr Oak	271*	24	104.5	Below 10° C.
5	McPherson	179*	24	104.5	Ice.
5	Sabetha	86*	60	104.5	Below 10° C.
6	Wichita	187	20	99	Ice.
6	Sedan	202*	48	99	Above 10° C.
6	Abilene	124	16	99	Ice.
6	Chetopa	114*	24	99	Below 10° C.
6	Independence	127*	18	99	Ice.
6	Cherryvale	117	20	99	Ice.
7	Atchison	71*	10	105	Ice.
7	Ft. Scott	138*	24	105	Ice.
8	Washington	190*	24	103	Ice.
11	Garnett	44	10	104	Ice.
12	Wathena	110*	36	103	Below 10° C.
12	Kansas City, Kan.	39	10	103	Ice.
12	Marysville	134	24	103	Ice.
12	Neodesha	196	24	103	Ice.
12	Cherryvale	117	24	103	Below 10° C.
12	Waverly	54	24	103	Below 10° C.
12	Scammon	144*	24	103	Ice.
13	Independence	127*	24	101.5	Ice.
13	Atwood	309*	48	101.5	Above 10° C.
13	Hewins	175	24	101.5	Ice.
13	Mound City	154*	24	101.5	Ice.
13	Meade	331*	24	101.5	Below 10° C.
14	Marion	143*	24	102	Below 10° C.
14	Delphos	195*	24	102	Below 10° C.
14	Holyrood	226*	24	102	Below 10° C.
14	Burrton	285	24	102	Below 10° C.
14	Atchison	71*	16	102	Ice.
19	Chanute	161*	24	99	Ice.
19	Elsmore	142*	24	99	Ice.
19	Eureka	134*	24	99	Ice.
19	Salina	146	24	99	Ice.
20	Columbus	191*	24	100.5	Ice.
20	Frontenac	211	24	100.5	Ice.
20	Chanute	161*	24	100.5	Ice.
21	Beloit	217*	24	101	Below 10° C.
21	Concordia	170*	24	101	Below 10° C.
21	Holton	50*	24	101	Below 10° C.
26	Green	173*	24	102	Ice.
26	Arkansas City	220*	24	102	Ice.
26	Holton	50*	24	102	Below 10° C.
26	Hays	250	24	102	Below 10° C.
27	Goodland	399*	48	104	Above 10° C.
27	Manhattan	80	16	104	Ice.
27	Medicine Lodge	296*	24	104	Ice.
27	Ottawa	27	10	104	Ice.
29	Manhattan	80	16	94	Ice.

*Transferred in shipment.

During the summer over one hundred and fifty shipments have been received at the laboratory. About fifty containers were sent in by the state sanitary engineer and members of the Survey staff, all of which arrived at the laboratory with the samples under 10° C.

Many of the samples examined at this laboratory are sent in by County health officers, city engineers and water works superintendents. From these sources over one hundred shipments have been received. Most of the men collecting the samples and packing the refrigerator had never seen the contrivance before. The results of one hundred and four shipments by city engineers, county and city health officers and water works superintendents follow:

All but ten of the containers reached the laboratory with samples below 10° C. Sixty contained ice, thirty-four had no ice, but were under 10° C.

Of the ten not in good condition, eight were en route forty-eight hours or over. Two were on the road only thirty-six hours, but the amount of water in the bottom showed that they were not properly packed.

From these results it is apparent that when properly iced, this container will keep samples under 10° for thirty-six hours in the hottest weather.

NOTE.—These containers were manufactured by the "3 H" Co., Lawrence, Kan. The bottles were furnished by Bausch & Lomb.

BOOK REVIEWS.

A Model Housing Law. *By Lawrence Veiller. The Survey Associates, New York. $2.00.*

The appearance of this volume is an evidence of the rapid growth of the movement for better housing in the United States. Four years ago when Mr. Veiller published "A Model Tenement House Law" the demand of the time only called for the regulation of tenement construction and maintenance. Since then we have learned that dark rooms and unsanitary conditions are just as objectionable in one- and two-family houses as in multiple dwellings. A strong sentiment is developing throughout the country that the slums must go, that the dwellings of the future, whether detached or in block, for one family or for many, shall be built in accordance with the best principles of housing construction.

The Model Law is carefully worked out to these ends. The object of all housing law is to secure suitable light and ventilation, good sanitation, adequate fire protection, decent privacy and proper maintenance in all dwellings, both new and old. Chapters are devoted to each of these subjects and also one to the necessary legal requirements and penalties, for a law without "teeth" is useless. Both the form and the substance of the Model Law are admirable. For the first time we have a general housing law so clear and simple in arrangement that even the man on the street can understand it as he runs. Without doubt all American legislation on this subject, whether state laws or local ordinances, will henceforth follow this form. The principles embodied in the law have been tested by experience and are sound, and the provisions are so carefully drawn that they seem secure against all attack from speculative building interests. The book is illustrated with a large number of diagrams and plans showing plainly what can be built under the law, and what changes must be made in old buildings to make them conform to modern requirements. Copious notes answer most of the questions which are likely to arise in connection with such a law and add greatly to the value of the book for those who are not experts on the subject. It is indispensable for all who are seeking by legislation to improve the bad housing which is to be found in almost every city and town, and to secure right living conditions in the future for all classes of people.

Elmer S. Forbes.

City Planning: *A comprehensive analysis of the subject arranged for the classification of books, plans, photographs, notes and other collected material. By James Sturgis Pray, chairman, school of landscape architecture, Harvard University; and Theodora Kimball, Librarian, school of landscape architecture, Harvard University—103 pages, Paper Cover. Price $1. Harvard University Press, Cambridge, 1913.*

Who better than a landscape architect with the training of practice, travel and teaching, in collaboration with an experienced librarian, could arrange a syllabus of City Planning that would be of value to those affected by the development of our towns, as well as to the bibliographer?

The long list of carefully arranged titles is, indeed, a syllabus rather than a basis for a bibliography, but that makes it all the more useful. From the point of view of public health, such headings as: education of public, regulative legislation, coöperation of experts, hygienic aspects of planning, playgrounds, athletic fields, park systems, types of city plans distinguished by climate, suggest the variety covered.

There is a classification of the subject of housing, streets, and street arrangement, gardens, garden cities, besides an elaborate summary of all the other points of view of Town Planning. With a list of this kind, not only are suggestive titles at hand for the arrangement of literature, and the rapidly

accumulating material coincident with the work of any professional men, but there are also at hand many suggestions for further study along lines as yet insufficiently developed. This classification should be "useful alike to the municipal official, the business administrator, the civil engineer, the sanitary expert, the transportation engineer, the housing reformer, the architect, and the landscape architect, as well as the representative of any one of various other special services, in proportion as his occupation enters and contributes to the field of city planning; and the index will show him quickly at what points his special material is provided for."

In an individual classification the suggestion of checking the printed index to show the presence of material as it is classified, is so simple that it is really likely to be followed. The classification is arranged so that, although it is based on the Library of Congress classification, it can also be applied to other systems, such as the Dewey decimal classification, and a summary is given to show the possibility of inter-locking the two systems. The geographical arrangement is practically that of the Library of Congress, and there is a long alphabetic subject index.

A preliminary outline was published several months before the final anaylsis, for circulation among critics; Mr. Olmsted on the Data for City Planning; Mr. Flavel Shurtleff on Legislation, Professor Killam on Types of Building Construction; Mr. John Nolen, Professor Ford of Cambridge, Professors Brix and Genzmer of Berlin, and others. Their criticism has had a beneficial effect in the result.

It is undoubtedly true that it would be extremely difficult to carry out a library classification along the lines indicated for the simple reason that the books that have been published are not arranged under similar divisions. Certain of these subjects will have whole volumes to themselves, while other subjects will be grouped with surprisingly foreign material. It is somewhat startling to see wires, sewerage conduits and subways for rapid transit all classified under "channels of transportation."

It must be added that the whole analysis that is so scholarly and carefully worked out it is sure to be a reliable, if not the standard basis for future classification of the rapidly growing subject of city planning.

F. A. Bourne.

The Health Master. *By Samuel Hopkins Adams. Houghton Mifflin Company, Boston and New York. Price $1.35.*

A great deal of popular literature dealing with disease prevention that has been published in recent years may be justly criticized because of some of the exaggerated and far-fetched statements that are made. Such a criticism of this highly entertaining and instructive book by Mr. Adams cannot be made. In reading it one finds no statements that are not either based on facts, or where facts are unobtainable, upon the "best rational probability and statistical support." The story centers around the family of Mr. Clyde, into which Mr. Clyde introduces the "Health Master," a physician who is to keep the family well, upon the Chinese plan. The different characters are admirably sketched. The plan of the book may be understood from some of the chapter headings: Chapter VI, "The Re-Made Lady," dealing with personal hygiene; Chapter VII, "The Red Placard," on the quarantine family; Chapter XI, "The Besieged City," with an epidemic period. Health authorities could undertake no better form of popular instruction in public health than to utilize this little book.

Mark F. Boyd, M. D.

HEALTH DEPARTMENT REPORTS AND NOTES.

REPORTS

Easton, Pennsylvania.

The report of the Board of Health of Easton for the year 1913 is included in the report of the city and consists of only about sixteen pages, all told. Apparently public health work in Easton is not in a very flourishing condition, in spite of the fact that the city has a population of 30,000, and seems lively in other respects. This may be an outgrowth of the old form of city organization which has been remodeled since December 1, 1913, by the Clark Act. This act appears to constitute the mayor and council of the cities of the third class as a board of health, *ex-officio*. A single man constitutes the entire active force in health work.

It is interesting to note the relative amounts expended by the city in various lines during 1913. The Fire Department received $27,000; the Police Department $20,000; Garbage Disposal, $16,000; and the Board of Health, $1,300; or about four and three-tenths cents per capita population. Surely a disgrace to any city in our present state of civilization. Of the $1,300, as might be expected with so small an amount, the majority, $884, was spent on quarantine and contagious disease; $350 was spent in "salaries," the portion received by the health officer not being stated.

In view of the small remuneration of the health officer it is interesting to note his excellent record of 1,049 nuisances inspected, 592 houses quarantined, and 527 houses "fumigated and released." The report of the Board of Health is wholly statistical and consists largely of a monthly statement of deaths classified by the typically unsatisfactory system for which Pennsylvania cities are becoming notorious. No rates are given, but, as worked out from the figures, the birth-rate appears to be about 22 and the death-rate 18.3, although this latter probably included stillbirths. No figures are given from which the infant mortality can be obtained.

The report is signed by the city clerk and no report of constructive work nor suggestions as to necessities for future improvement are given.

Hartford, Connecticut.

The Board of Health of Hartford, through its superintendent and others, presents its annual report for the year 1913. Hartford has a population estimated at 104,634. The corrected death-rate for 1913 was 14.63. The birth-rate was 30.2 and the infant mortality rate 105.3 per thousand births. The city expends about 27 cents per cpaita per year for the Health Department, but this does not include the collection and disposal of garbage.

The report is especially pleasing in general appearance and in addition to the report of the superintendent of the board contains many interesting and well-prepared reports from the various members of the staff. The sanitary inspectors report a general improvement of conditions, but urge extension of sewers, improvements in the sanitation of trolley cars and an ordinance regulating the stables of the city as means of getting still greater improvement.

Tenement inspection has been made more thorough by the employment of an additional inspector. All tenements have been visited at least three times in the year and orders have been followed up by reinspections.

The milk inspector reports 2,088 inspections during the year and has brought about an improvement in conditions both among producers and middlemen by educational work and occasional prosecutions. The milk

bacteriologist has examined 1,987 samples of milk chemically and for visible dirt. In two years, during which the dirt test has been made, the percentage showing dirt has decreased from 100 per cent. to less than 10 per cent. Publication of results is urged to stimulate further improvement.

Other reports are by the chief bacteriologist, the plumbing inspectors and the food inspectors.

La Crosse, Wisconsin.

Although the report of the city of La Crosse for 1913 is not a pretentious one it is, in general, excellent, both in preparation and in respect to the work reported. Few western cities of the size of La Crosse (estimated population 31,000) issue any annual report of the Health Department and many eastern cities, even though larger, do not issue as good a report.

La Crosse spends only $6,000 per year for health work and $1,640 went for garbage removal in 1913, leaving only about fourteen and one-half cents per capita for health work in the stricter sense of the word. Three thousand eight hundred fifty dollars a year goes for salaries and apparently is very profitably invested. The corrected death-rate is given as 9.0 but from the mortality report appears to be 12.7. The birth-rate is 21.3 and the infant mortality rate presents the Utopian figure of 39.3. The classification of deaths by causes would be improved by a little stricter adherence to the International System and by more careful proofreading.

In addition to financial and vital statistics we find tabulated reports of medical inspection of schools, of visiting work by the school nurse, of sanitary inspections, and of laboratory work. This latter includes a total of 2,780 examinations of specimens; including milk and cream analyses; diagnosis for diphtheria, tuberculosis, and typhoid; and various miscellaneous analyses.

The keynote of the whole report is a plea for interest, coöperation, and constructive criticism by the citizens. Doctor Furstman, the commissioner of health, explains what he is trying to do, why it needs doing, and how the people can help. He especially requests their coöperation in the disposal of garbage and in getting an isolation hospital, so that the expense of contagious disease may be distributed among the whole population instead of resting upon those least able to bear it. His work in breaking up threatened epidemics has been prompt and effective.

North Yakima, Washington.

The report of Dr. Thomas Tetreau, health officer of North Yakima is included in the annual report of the city for the year 1913. North Yakima has an estimated population of 18,000 and spent $20,832 in 1913 on its Health Department, which does not include $4,378 spent by the city meat inspector and plumbing inspector. Excluding the cost of garbage collection about 62 cents per capita is spent by the Health Department.

It is unfortunate that Doctor Tetreau's report consists solely of statistics, as a more complete account of his activities would be interesting and instructive. His results speak loudly for his methods. The corrected death-rate for the year is 7.6; the birth-rate, 14.6; and the crude infant mortality rate, 91.3. Not a single death among resident cases is reported from measles, scarlet fever, whooping cough, diphtheria, or typhoid. Only one case of diphtheria was reported during the year and this was a child brought into town for treatment at the hospital.

Among the special reports included are those of the dairy and creamery inspection; of sanitary inspection; of the food inspector, the city nurse; and the bacteriologist, the last three being women. All indicate active and effective work.

DEPARTMENT NOTES

"Vacation Typhoid."

Doctor Landis in the March 28 issue of the weekly report of the board of health of Cincinnati makes the following suggestions to the people of Cincinnati in the hope of cutting down his typhoid rate in August and September.

"Plans for summer vacations are being made by many residents of the city. Some will go to the lakes, some to the mountains, others to the seashore or the country. A large portion of these people believe that these places represent the last word in sanitation. Many of them do, but the primitive variety that spells typhoid fever, plagues of mosquitoes and flies, poor garbage and sewage disposal and sloppy service in dining-room and other portions of the hotel.

"Cincinnati's water supply is of known purity. Rudolph Hering, the great New York sanitary engineer and world-wide authority on filtration plants, has expressed the opinion that Cincinnati's results in water purification, can not be duplicated anywhere else in the world.

"Every year our population of non-immunes to typhoid fever becomes greater. Absence from the city and the use of an inferior grade of water carries a risk that all should realize. Safety can be secured by taking the typhoid vaccine treatment. It is sure in its power to confer immunity and is not attended by danger.

"Many summer resorts are distributing centers for typhoid and none should be patronized without first securing information about local conditions, special care being exercised to learn about the water supply and the methods employed in disposing of sewage and garbage.

"Hundred of people would be better off financially and safer, from a health point of view, if they remained in the city and spent their vacation in Eden Park, Burnet Woods or other parks or places of amusement where sanitary conditions are known to be all right."

Possibly we shall come to the time when summer resorts will need to be "inspected and passed" by a state board of health before they will be patronized.

The Floating Bath in New York.

The following article, clipped from the *Weekly Bulletin* of the Department of Health of New York City, is the latest development in the discussion of the possible danger to health occasioned by the use of the floating bath:

In view of the enormous extent of the sewage pollution of the waters surrounding Manhattan Island, bathing in these waters is bathing in sewage. This is not only indecent, but absolutely dangerous to health. The following letter shows the attitude of the department of health on this matter and requires no further comment:

"March 20, 1914.

"Hon. Marcus M. Marks, President of the Borough of Manhattan, City Hall, New York:

"*My Dear Mr. Marks:*—This department has not neglected your communication of February 3d in relation to floating baths. The matter has been under careful consideration for some time and indeed was made the subject of a report by the sanitary expert of the department to the commissioner of health in December last. The subject was also under consideration during the summer of 1913 and previously.

"You are doubtless familiar with the work of investigation which has been carried on recently by the Association for Improving the Condition of the Poor. The results of that investigation are not before me, but, from a conversation with officers of the association recently, I am led to believe that this private investigation will strongly confirm the investigations previously conducted by the department; indeed, nobody can look into this question without concluding that sooner or later the city must abolish its floating baths. And if the municipal floating baths are abolished, we must, in all consistency, take steps to suppress the private baths also.

"Numerous inspections of the waters surrounding Manhattan have been made during 1910, 1911, 1912, 1913, 1914. These inspections include color tests of nearly all trunk sewers discharging into the East and Hudson Rivers. The tests prove conclusively that these waters are highly polluted with sewage.

It is estimated that 499,800,000 gallons of sewage are discharged daily from Manhattan. This sewage oscillates between Fort Hamilton and Throggs Neck, being carried back and forth by flood and ebb tides. Under these conditions the natural process of self-purification is necessarily impeded and limited.

"Chemical and bacteriological tests are not necessary to prove the extent of pollution. Personal observation along the shores of Manhattan shows the presence of fecal and other matter offensive to sight and offensive in odor.

"Typhoid cases have frequently been reported to the department, in which the history shows that the victims had bathed in the ocean, in the sound, and in the rivers about the city. Owing to the possibility of other sources of infection, however, it has not been practicable to prove beyond peradventure in these cases the relation between typhoid fever and river bathing, but that such bathing is dangerous there can be no doubt, in view of the condition of the waters.

"In my opinion, the city will be on the right road if it aims at the suppression of the river baths and the substitution for these of interior baths, properly constructed and administered. This department will do its share toward creating an intelligent state of public opinion on the subject and toward regulating the activities of owners of private baths.

"Very truly yours,

"S. S. Goldwater, *Commissioner.*"

Physical Examination of Push-cart Peddlers.

At the request of the Mayor's Bureau of Licenses, hereafter all applicants for licenses to peddle from push carts will be examined at the tuberculosis clinics of the Department of Health. No applicant whose sputum contains tubercle bacilli will be recommended for a license. While all applicants will be examined, irrespective of their physical condition, it is the intention to recommend for such licenses those who by reason of illness would be benefited by open-air employment. Tuberculous persons in fair physical condition, and with sputum free from the bacilli, and others whose physical condition requires open-air employment, will therefore be given preference.

Weekly Bulletin of the Department of Health of New York, April 4.

Following Up Discharged Cases of Contagious Disease.

The *Weekly Bulletin* of the Department of Health of New York City in its issue of April 4 contains two interesting notes on the following up of cases of contagious disease which have been discharged from the hospitals of the Department of Health:

"Beginning April 1st, 1914, all cases of scarlet fever, diphtheria, and measles, discharged from the hospitals of the Department of Health, will be at once revisited by the district nurse of the Bureau of Infectious Diseases, to determine the condition of the patient on discharge (as to infectivity, etc.) and the home conditions of the family. Advice will be given as to care of convalescent patient, and, if necessary, the family will be referred to the proper charitable organization for financial aid and other assistance. At least one additional visit will be made after the expiration of the incubation period of the disease in question, to ascertain if any secondary cases have developed.

"It is the desire and intention of the commissioner of health to eventually give to this work the full force of hospital social service visiting in the complete sense of the term. This will, of course, necessitate a large staff of district nurses. The establishment of a special convalescent home for suitable cases of this kind is one of the possibilities that is being borne in mind."

"A study has recently been made to determine how effective were the precautions taken to prevent the carriage of contagious diseases into homes through patients discharged from the contagious disease hospitals of the Department of Health. Eighty-eight cases were discharged from the Kingston Avenue Hospital during the month of January and in only one instance was a contagious disease carried in this way. This was in a girl five years of age who developed scarlet

fever two days after the return of her sister from the hospital. It is planned to continue these studies and apply the experience gained to perfecting, as far as possible, the administration of the contagious disease hospital."

Health Officers' Association of New Jersey.

The regular March meeting was held in the Ridgeway House, Camden, N. J., on March 27, 1914.

The executive committee met at 4 p. m. to act on applications for membership and on other matters that had been referred to it.

The business meeting was called to order at 5 p. m. by the president, Dr. F. W. Sell, of Rahway, N. J. Various committee reports were presented, the most important of which was that relating to laws and legislation. The committee reported that a bill was introduced into the state legislature making it mandatory for boards of health to appoint a registrar of vital statistics. Another bill related to the filing of birth and death certificates of non-residents, making it mandatory upon the registrars to forward copies of such certificates to the town in which the persons resided.

A general discussion of laws relating to the exposure of food to dust and dirt, of the methods used to secure reports of cases of syphilis and of the methods used to prevent flies from breeding in horse manure followed.

Following a dinner at 6.30 p. m., Dr. William M. Welch of the Department of Health of Philadelphia gave a very illuminating address on "Scarlet Fever," with especial reference to the chief characteristics that aid in diagnosis. Dr. A. A. Cairns of the Department of Health of Philadelphia then gave a detailed account of how quarantine was enforced and how disinfection was performed in Philadelphia.

After an extended discussion the meeting adjourned.

Montclair, N. J.

C. H. Wells, Secretary.

Do They Apply to Your Own City?

The Bureau of Municipal Research after making a survey of conditions in Toronto says that, to make it a better, cleaner city, Toronto needs the following:—

"Stricter measures against overcrowding tenements.
A general clean-up day.
A municipal lodging house.
Stricter enforcement of smoke-nuisance regulations.
A house-to-house-sanitary inspection.
Elimination of railroad grade crossings.
Follow-up inspections to enforce sanitary reforms.
Removal of unsightly, abandoned buildings.
Improvement of roadways in streets occupied by municipal tramways.
Surrender of railroad property desirable from a city beautiful standpoint."

Stimulating Interest in Public Health.

"A new feature was added to the public health exhibit of the Ohio State Board of Health in Newark, when a local newspaper, the *Advocate*, undertook a health contest. Coupons were printed in each issue and these could be exchanged for attendance coupons after each public health lecture. Three attendance coupons rendered the owner eligible to enter the contest. Each person submitted ten suggestions for the betterment of health conditions in Newark, and there were three prizes offered, $50 in all. This plan was so successful in Newark that it was continued in Zanesville and Coshocton, where it met with the same success. Not only was the attendance at the public health lectures increased but more interest was taken in local sanitary conditions, and the suggestions offered were in many cases not only interesting but of practical value."

Journal of the American Medical Association, April 11.

Where Ignorance is Bliss.

In view of the growing belief that keeping the city clean is rather a matter of decency than of public health the following clipping from the *Journal of the American Medical Association* is, perhaps, an especially interesting commentary on the intelligence of public officials when it comes to a question of public health:

"The Sandusky Board of Health recently requested the city council to put aside a certain sum of money for a public health exhibit. This the council refused to do, giving as an

excuse the fact that the duties of a board of health were not educational, and that the board would be better occupied in cleaning up the city than in attempting to place an exhibit before the people. A number of physicians and the Board of Health of Sandusky were so much impressed by the public health exhibit of the State Board of Health that they decided to continue the campaign of education along public health lines by means of a local exhibit. It was planned to have the engineer in charge of the filtration plant show how the system operates, and give a practical demonstration of the examination of water, and many other features of great local interest and importance were to be added to the exhibit. It is to be regretted that an intelligent campaign of this character should meet with failure."

Public School Health System.

"The city of Albany, New York, has developed an excellent system of health direction in the public schools, which it is the aim of the medical director to extend considerably beyond the usual concept of mere medical inspection of school children. Recently a dental dispensary has been added which aims to take care of the teeth of children who are not able to pay for the services of a dentist. A set of blank-cards has been provided for keeping record of the dental work done for the pupils. One of the cards contains sociological data concerning the family from which the pupil comes. The cards given to the children recording appointments and granting admission to the dispensary contain practical admonition to the pupil and parents as to the importance of taking care of the teeth, their influence on the physical and mental development and the bearing of proper development on future success in life, all of which should have a wholesome educational influence. The school work in Albany is an example of how a scientific foundation along lines of school hygiene can be made successful through the coöperation of progressive citizens, trained educators and child hygienists. The dental dispensary is not the least valuable department of this feature of the health work in the public schools."

International Hospital Record, April 10.

Hints for "Clean-up Week."

Rockford, Illinois, has recently had a spring cleaning. The mayor first issued a proclamation setting a certain week for the purpose and at the close of the week the city sanitary inspectors made a thorough inspection of the city and issued orders for correction of all insanitary conditions found. These orders are being enforced by reinspections.

In the *Quarterly Health Bulletin* of the city the following suggestions in regard to cleaning up were made:

"See that all rubbish is removed from your cellar, back yard and surroundings. Be clean—not merely personally clean, but clean in habits.

"Then, don't forget to ventilate damp cellars. Clean all windows and keep them open to fresh air and sunlight.

"See that all leaky roofs and bad plumbing are repaired, and do not tolerate dirty, broken walls and ceilings.

"And don't forget what plenty of soap, hot water and sunshine will do to assist you in cleaning up.

"Do not forget the attic or any remote place where flies and germs breed.

"Dry sweeping and dry dusting is a dangerous practice. Raising dust from floors and furniture to let it lodge on walls, ceilings or unnoticeable, is the cause of many infectious and contagious diseases. USE the damp broom, the oil-mop, damp and oiled cloths method of sweeping and dusting.

"Burn old waste paper and all other household rubbish at least once each week. Do this in your kitchen range, the laundry stove or furnace.

"Drain moisture from garbage before placing it in the garbage can. Provide yourself with proper garbage can as required by our city ordinance—covered can, made of galvanized iron, not less than fifteen inches in diameter and two feet high. Put this can in a readily accessible place where the garbage collector can reach it.

"Do not throw waste paper of any description on any public street, park nor in your own yard.

"Don't expectorate on any sidewalk, street car or on any floor. It is a detestable habit, breeds disease and is against the law.

"Don't let milk bottles stand unwashed

after use. Wash them at once and don't fail to rinse the bottle in cold water before scalding.

"Don't forget the stagnant pools and ill-smelling refuse piles. They breed mosquitoes and flies, and consequently disease. Keep the loose manure in covered boxes and have it carried away at least once a week.

"*Remember that our House-to-House Inspector* will examine your plumbing, cellar rubbish pile and other conditions apt to be insanitary. Carry out the above suggestions and it will be unnecessary for him to serve a notice for you to clean up.

"*And remember*, that cheerful compliance with these suggestions and with every other effort of the calth department, will help to make our city a more healthful one to live in."

What Everyone Should Know About Hookworms.

"1. The largest hookworm is only about three-fourths of an inch long—the male a little smaller.

"2. The adult hookworms live in the alimentary tract in human beings.

"3. They lay large numbers of eggs in the alimentary tract.

"4. These eggs are passed out in the stools.

"5. Where sewage is properly disposed of the eggs are destroyed and no harm is done.

"6. But when no privy even is used the eggs are deposited on the ground where they hatch, and

"7. In a few days the baby hookworms are ready to attack the feet of any barefoot child that chances to come along.

"8. This they do by burrowing into the skin, producing what we know as ground itch.

"9. They get through the skin into the circulation, through which they pass till they reach the lungs.

"10. There they are coughed up and swallowed.

"11. When they reach the intestines they grow up to the adult hookworms, and the child begins to get pale.

"12. This child in turn begins to deposit hookworm eggs as the one before him did, and so on in an endless cycle.

"13. If you suspect your child has hookworms write the State Board of Health."

Bulletin of Texas State Board of Health, January.

The Disposal of Waste in Philadelphia.

"The Philadelphia highway bureau has asked for a detail of seven patrolmen from the department of public safety, one to be assigned to each highway district. The duties of these men are, first, to warn scavengers, and then, if the nuisance of interfering with waste put out for collection is persisted in by the scavengers, to arrest them. The act of April 20, 1905, makes it unlawful to throw waste paper, sweepings, ashes, household waste, nails, or rubbish of any kind into any street or to interfere with the contents of any receptacle containing waste. The act further provides a punishment of fine and imprisonment.

"These patrolmen are also to call the attention of householders to the Housing Act of July 22, 1913, which requires that occupants of dwellings shall provide a non-leakable receptacle of an approved standard for ashes.

"It is evident that peach baskets and such nondescript receptacles are not of an approved standard," and where ashes are put out in receptacles that are not tight and durable they are not collected. The householder is warned in advance of the housing law providing for proper receptacles by the distribution of Call for Waste cards, left at every house by order of the bureau.

"It is hoped by this means to eradicate the very distressing evil existing in Philadelphia as well as other cities of littering sidewalks and streets by the careless way in which waste is put out for collection. The Call for Waste card is designed to hang in the front window or in a conspicuous place in front as a notice to the collector to call either at the front or rear of the building for the waste and thus do away with the necessity of putting it out on the sidewalks. This does not refer of course to ashes which must be deposited in proper receptacles on the sidewalk for the collector.

"In addition to this work being carried out by the bureau, Mrs. E. W. Pierce has been appointed to get the coöperation of householders and school children in preventive street cleaning work, by means of addresses at public meetings and women's clubs and talks in schools at assembly. Following these instructions the children put them into effect at home and write compositions expressing their ideas in regard to cleanliness

and health. For any specific work, no matter how small, or for ideas expressed in writing, the children are awarded badges as volunteer inspectors, and this responsibility is greatly appreciated by the boys and girls."

National Municipal Review, April.

The State Control of Disease in Minnesota.

Public Health Reports for April 24 prints the following regulations promulgated by the Minnesota State Board of Health which have several features of interest:

"Physicians in all parts of the state are required to notify immediately the division of epidemiology of the State Department of Health by telegraph or telephone whenever they discover cases or suspected cases of the following-named diseases:

Actinomycosis.	Paragonimiasis.
Anthrax.	Paratyphoid fever.
Dengue.	Pellagra.
Asiatic cholera.	Plague.
Dysentery:	Rabies (human cases and
(*a*) Amebic.	exposed persons).
(*b*) Bacillary.	Rocky Mountain spotted
Glanders.	(or tick fever.)
Hookworm disease.	Trichinosis.
Leprosy.	Typhus fever.
Malaria.	Yellow fever.

"The use of the telegraph and telephone permits the information to reach the division of epidemiology without delay and makes it possible for the State Department of Health to send immediately an epidemiologist to investigate the case and to see that such precautions are taken that other individuals will not be endangered. The diseases required to be notified in this way are those which are communicable but not very common in the state. Requiring the notification of suspected cases, as well as those in which the diagnosis has been established, saves the physician considerable annoyance, as he does not need to delay making his report until he has been able to entirely satisfy himself as to the nature of the disease. It also enables the physician in case of doubt to secure in consultation the services of a state epidemiologist."

"Little Mother's" Training Course

"The first movement toward the establishment of a Little Mothers' League in Detroit public schools was made in November, 1911. Classes were formed in McMillan, Wilkins and Bishop schools from the seventh and eighth grades and limited to ten members in each class, so that individual attention could be given each member. Half hour classes were held each week at the close of the regular school session and were not compulsory, but such good results have been attained that it is hoped to have the work eventually placed in the regular school curriculum.

"The members of the League have been most enthusiastic and requests have come from the girls to continue the lessons or repeat them.

"The lessons are made as simple and instructive as possible, practical demonstration as well as theory being given. The course is divided into six lessons, as follows:

1st. *Infant Hygiene*—

"The value and necessity of sunshine, sleep, proper food, clothing and cleanliness.

2d. *Clothing*—

"Proper outfit exhibited and reasons given for having loose, soft, warm and simple clothing.

3d. *Bathing*—

"How to prepare for bath, articles necessary, temperature of the room and water, and position in which to hold baby.

4th. *Bath Demonstration*—

"Using a large doll and regulation baby tub, giving bath in full detail, and dressing doll.

5th. *Feeding*—

"Laying special emphasis on the fact that mother's milk is the best food for baby; the necessity of consulting a physician for formulas; how to keep feeding bottles and nipples clean; care of clean, cool milk—milk to be kept clean and cool; dangers of using pacifiers, long tubes between bottles and nipple, of giving baby tea, coffee, patent medicines; precautions to take when baby has diarrhœa.

6th. *Review*—

"Going over each important point carefully, instructing the member to write an

essay on 'How to Keep the Baby Well,' which effort is rewarded by the presentation of a certificate."

Bulletin of Detroit Board of Health, March.

Special Course in Vital Statistics in Kansas.

The Extension Division of the University of Kansas has completed arrangements for a course of study in vital statistics and demography, particularly for local registrars, health officers, and physicians, sanitarians and engineers.

It is designed in this course to bring out the proper methods of determining the movements of population by studying the elements which influence its movements; the uses of vital statistics from both a legal and sanitary standpoint; methods of figuring death rates; methods of correcting or standardizing death rates; some work in the arithmetic of inexact numbers and the laws of probability, and the classification of the causes of death. The course will be made in eight assignments.

Arrangements have been made with Doctor Wilbur of the Division of Vital Statistics, Bureau of the Census, to send the 1911 report of this Division without charge to all students of this course, which report will be used in the form of a text book.

Mr. W. J. V. Deacon, the state registrar has written to the county and municipal officers urging them to take advantage of this opportunity. He points out that

"Without an understanding of this important branch of the work there can be no really efficient public health service, and it is to be hoped that many of the health officers of Kansas will avail themselves of this somewhat exceptional opportunity to familiarize themselves with the technique of vital statistics in order that they may prepare comprehensive reports of their counties, not only for the benefit of the counties themselves, but for their own benefit as well."

All communications with regard to the course should be addressed to the University Extension Division, University of Kansas, Lawrence, Kansas.

Health Epigrams.

"Good health is every one's privilege.

"An ounce of efficient achievement is worth infinitely more than a moral explosion.

"A thousand people are engaged in lopping off the branches of evil to one engaged in axing at its root.

"Only because we are accustomed to this waste of life and prone to think of it as one of the dispensations of Providence, that we go about our business little thinking of the preventive measures that are possible.

"The hog is fortunate in being an animal of commerce. If it were not, the waste of hog life would doubtless exceed that of human life.

"If it is right for the state to appropriate money for the *relief* of distress it is certainly right for the state to appropriate money for the *prevention* of distress, which means prevention of disease.

"A city's reputation may not be built upon its good health, but there is nothing which will ruin its reputation more quickly than its bad health."

Buffalo Sanitary Bulletin, February 28.

Boston Saves School Children.

"Does it pay to give physical examinations to school children and to advise them and their parents of any impairments that may be found?

"The city of Boston answers in the affirmative and gives results that are most convincing.

"Last year Boston's 87 school physicians under the direction of Dr. W. J. Gallivan, examined nearly 120,000 school children. Of these about 40,000 or one third, were without defects and about 80,000 had defects that needed medical attention.

"The special feature of the work of the year was an attempt to find out how many defects were corrected through the initiative of parents, after they had been notified by the school physicians.

"Results at the end of the year another examination was made and it was found that 70 per cent. of the defective palates had been attended to, 74 per cent. of the skin diseases, 25 per cent. of the defective teeth, 43 per cent. of the bad tonsils, 66 per cent. of the malnutrition, 65 per cent. of the nervous diseases.

"There are many cities that are neglecting the health of their school children. They do not seem to be sure that it would pay. Why should they hesitate longer?"

The Human Factor.

Safeguarding the Milk Supply.

Believing that a high bacterial count in milk indicates possible danger whether due to dirt or to age and insufficient refrigeration, and that much of the summer diarrhœa of infants is as much due to bad care of milk by the consumer as to improper conditions of production, the Department of Health of Rockford, Illinois, issues the following "Warning" through its *Quarterly Bulletin*:—

"If our milk supply were clean and cooled immediately after being drawn, and kept ice cold until consumed; if flies were excluded from the babies and what they eat, and the babies given a carefully selected milk diet—then gastro enteritis, diarrhœa of infants, would practically disappear.

"Milk as a single article of food ranks preeminent, and therefore should be protected against contamination. While it is common knowledge that bacteria grow very rapidly in warm milk, yet it is often allowed to become warm by careless milkmen and indifferent consumers. When milk gets warm the bacteria double every twenty minutes—imagine the enormous growth when allowed to become warm and remain so for any length of time.

"See that your milkman has his milk iced. If not, telephone his name and license number to the health department.

"Safeguard yourself and children by keeping your milk ice cold. Don't allow your baby to drink milk that has not been properly cooled and kept cold until consumed.

"Milk requires careful handling at all seasons, but special care during the hot weather. The greatest essentials in the production of good milk are—cleanliness and proper handling. Keep the milk cold and keep it covered. Do not let it stand in the sun after delivery by the dealer, but place it immediately in the icebox."

Health Officers Conference of Louisiana.

The State Health Officers of Louisiana held a conference in New Orleans, Monday, April 20, pursuant to the call of Dr. Oscar Dowling, president of the State Board of Health. As mayors of cities and towns and presidents of police juries (the county legislative body) in Louisiana are fiscal agents of health appropriations, they were invited.

The number in attendance was large, every section of the state being represented.

Two phases of local work were emphasized, the application of the law, and practical means of improving local service.

Dr. William C. Woodward of Washington discussed "The Functions of Legislation in the Conversation of Public Health," and Dr. R. S. Warren of the United States Public Service, "The Effects of Industrial Conditions in the Protection of Diseases." Dr. Oscar Dowling presided.

The position of secretary to the board of health and city health officer of the city of Cumberland, Allegany County, Maryland, will be vacant after May 1, 1914. Applicants must be trained sanitarians and bacteriologists, devoting their entire time to the office. A good salary is provided. File applications with, or write for further information to, the Board of Health, Cumberland, Maryland.

A superintendent is wanted for the Chicago Municipal Tuberculosis Sanatorium which is now nearing completion. It is planned to open the institution before the end of the year 1914. The initial capacity will be 600 beds; ultimate capacity 900 beds.

The sanatorium is situated on a 160-acre tract of land near the city limits. In planning the institution, the utmost effort has been made to incorporate into it all the modern administrative and medical provisions. In its medical arrangements are included a comprehensive laboratory provision, X-ray rooms, and all other modern facilities essential to the thorough study and efficient treatment of tuberculosis cases.

This is an excellent opportunity for a good medical man of right attainments, experience and executive ability. The position will be filled at an early date. Salary $5,000 a year and quarters and subsistence. Application should be made to the president, Chicago Municipal Tuberculosis Sanatorium, 105 West Monroe Street, Chicago.

PUBLIC HEALTH NOTES.

Conference on Betterment of Hygienic Conditions Among Negroes.

Betterment of negro health was the subject of a conference of Southern health and educational officers, held in New Orleans, April 24.

The meeting was called by Dr. Oscar Dowling of the Louisiana State Board of Health. Five states and the District of Columbia sent delegates. Eight of the leading negroes of the South were present.

To agree in practical measures for ultimate and immediate betterment was the purpose of the conference. Speakers and visitors were unanimous that the call was timely and that the need for concerted action is imperative.

After lengthy discussion resolutions embodying the sense of the convention as to pertinent and practicable measures were adopted. They are as follows:

Recognizing that sanitary conditions now prevailing among negroes are susceptible of improvement and that for the health, welfare and prosperity of both races immediate effort for betterment should be made:

Be it resolved, That the responsibility of instituting and executing measures to this end is largely that of the white man;

That the active coöperation of the more intelligent negroes should be asked and their services utilized as far as possible in executing the plans adopted and in enlisting the coöperation of others of their own race;

That one point of attack should be on prevailing insanitary housing conditions, the main remedy being to enforce rigidly sanitary regulations pertaining to the disposal of night soil and other wastes, provision of a wholesome and adequate water supply, ventilation, and light;

That each state and municipality make definite effort to obtain exact information as to the prevalence of tuberculosis, venereal and other diseases among negroes; that practical preventive measures applicable to local conditions be instituted; that the data gathered be transmitted to the local and state health officers;

That instruction, definite and persistent, in the primary principles of health be given, special features of the systematic work to be a program on health topics in every negro school in the state and sermons and talks on sanitation in every negro church at frequent intervals;

That teachers be asked to emphasize in every possible way, in discipline and in methods of teaching, the element of self-control;

That visiting district nurses should be employed;

That a copy of these resolutions be sent to each state and city board of health with the request that definite action be taken to carry these recommendations into effect;

That the American Medical Association, the American Public Health Association, the Southern Medical Association, the Southern Sociological Congress, the Southern Commercial Congress, the National Educational Association of America, the National Housing Association, the Federation of Women's Clubs, and other health and educational organizations, be requested to establish standing committees on the health of the negro.

(Signed)

Wm. C. Woodward, Washington, D. C.
James A. Hayne, S. Carolina.
C. W. Garrison, Arkansas.
T. F. Abercrombie, Georgia.
Jno. C. Bell, Memphis, Tenn.
Herman Oechsner, Louisiana.
Thos. A. Roy, Louisiana.
S. R. Mallory, Kennedy, Fla.
Oscar Dowling, Louisiana.

Safeguarding Marriage.

Public Health, the monthly publication of the Michigan State Board of Health, contains in its March issue several of the papers delivered at the recent National Race Betterment Conference. The following is quoted from the remarks of Dean Sumner of Chicago who spoke on "The Health Certificate as a Safeguard against Vicious Marriage Selections."

"If a man wishes to sell bananas from a push-cart in Chicago" began Dean Sumner, "he must bring a citizen with him, when he applies for the license to testify as to his good character. But if the same man desires to marry and raise a family, he can go alone to the city hall and secure his marriage license without even so much as a question being asked.

"Because no attempt has been made to safeguard marriage, except in late years, the country now has three million insane persons and criminals locked up in its institutions, at a cost of $200,000,000 annually.

"There are three ways to safeguard the marriage relation: First, by agreement among those who perform the marriage ceremony; second, by legislation; and third, by education. The latter method promises the earliest results.

"The boys of this country are learning that they have a calling just as sacred as the call to motherhood and that is the call to fatherhood. The boy can be taught sacredness of his body at his mother's knee. The parents who neglect such teaching are omitting a great opportunity.

"Mothers, take your boy to your heart and say: 'Somewhere, my boy, some mother's little girl is keeping herself pure for you; aren't you willing to keep yourself pure for her?' "

Preparing Turbidity Standards.

"Correcting silica turbidity standards prepared by weight by the use of a field method, as outlined in the standard methods of the American Public Health Association, is criticized, as being impossible of duplication by Francis D. West, chemist, Bureau of Water, Philadelphia, in a paper presented at the recent meeting of the Illinois Water Supply Association. He suggests, as an alternative, a method found satisfactory since its adoption in the Philadelphia laboratories in 1901. This method involves the preparation of diatomaceous earth. The Philadelphia method is to take a weighed amount of finely ground material, about 2 grams, and suspend it in 500 cu. cm. of distilled water, shaking vigorously for two or three hours. After suspending for ten hours the supernatant liquid is decanted and the residue dried and weighed. The difference equals the amount in suspension. This is diluted to standard and used as stock. Mr. West states that standards so made from different stocks do not differ perceptibly, as all material that remains suspended for ten hours appears to be of the same degree of fineness. Standards made in 1907 containing a small amount of mercuric chloride have not been found to change, but checks should be made every six months.

"To do away with the tedious grinding of the diatomaceous earth, the experience of preparing stock solutions with fuller's earth, first brought out by Dr. E. C. Levy, was also given by Mr. West. Five grams of sifted material, or 20 grams of unsifted fuller's earth, are agitated as above in a gallon bottle with one quart of distilled water. After ten hours the material in the suspended matter is determined by precipitation with a known amount of aluminum hydrate. Working them with a definite weight and definite degree of fineness, standards have been made of the fuller's earth which check exactly with the diatomaceous earth."

The Engineering Record, April 25.

Pure Water for Swimming Pools.

The Surveyor in its issue of April 17 contains a note on a proposal which has been submitted to the Nottingham City Council for the treatment of water for swimming pools where the conditions resemble those of the New York Floating Baths. We quote as follows:—

"Briefly stated, the scheme ensures a continual flow of water from rivers or other watercourses through swimming baths without loss or waste of water, in combination with a mode of filtering and heating the water. While the scheme is devised primarily for baths already existing, or to be built, in proximity to a watercourse, the principle is adaptable to premises not so favorably situated. Swimming baths by the riverside are not by any means uncommon, but, as Councillor Pollard points out, no attempt is made to filter or heat the water

used by them. They are often objectionable, and even unsafe, owing to the muddy river bed, while people too weak or delicate to use cold water baths are necessarily compelled to forego the pleasure of a swim, except in warm weather. Councillor Pollard hopes to induce the Nottingham Corporation to adopt his invention. If they do so the result will be watched with interest."

Government Hospitals for Southwest.

Bills have been introduced in the United States Senate and House providing for the use of abandoned military reservations and other government property in the southwest for tuberculosis hospitals for indigent consumptives. The hospitals are to be operated under the direction of the United States Public Health Service, the regulations for the administration of the institutions to be issued by the secretary of the treasury. The bills also provide that the United States Public Health Service hospital at Fort Stanton, N. Mex., may be used for any indigent consumptives who "have contracted their infection in another state and who by reason of their affliction are a menace to interstate commerce."

These bills have been introduced at the instigation of a committee of ninety-nine appointed by Governor Colquitt of Texas in accordance with a resolution of the Southwestern Tuberculosis Conference. The Texas Public Health Association is carrying on an active campaign for their passage.

The bills are an attempt to solve the difficult problem of the care of the non-resident indigent consumptives in the Southwest. The supporters of the measure believe that the constant influx of tuberculous persons without means into the states of Texas, New Mexico, Colorado, Arizona and California, who are attracted by the climate, constitutes a problem which is interstate in its proportions and which should be treated by the Federal authorities as such. In a brief prepared to further the bill, the following statements are of interest:

"The states and cities of the Southwest cannot care for these unfortunates. They do not, as yet, adequately provide for the care of their own sick. The states and cities from which these people come do not aid them. The people of the United States as a whole should act to assist these consumptive citizens of the nation, but of no state or city. The Federal government should provide hospitals for tuberculosis as a matter of common humanity and for the prevention of disease."

The health records of one city in Texas for twenty-three years show a total of 34,608 deaths from all causes, of which number 6,959, or 20 per cent., were reported to have been caused by tuberculosis. Of the 6,959 tuberculosis deaths 2,282, or 33 per cent., had lived in the city less than six months prior to their decease, *the most dangerous period of their illness from the standpoint of infection of others.* Four thousand sixteen cases lived in the city less than three years prior to death, showing that they either came to the Southwest too late to be benefited by the climate or lacked proper care to restore them to health.

The Cause of Pellagra.

The Tropical Diseases Bulletin in its issue of March 30 contains a large number of reviews of recent articles on pellagra. From it we quote the following:—

An article entitled "Pellagra and the Sand-Fly" by S. J. Hunter in the *Journal of Economic Entomology.*

"The results of an investigation on the relation of pellagra to the presence of sand-flies in Kansas are recorded. The following facts have been ascertained:—(1) The number of sand-flies has been directly proportional to the number of cases of pellagra, while the first appearance of the cases coincides with the principal broods. (2) Sand-flies which are fed on human blood live several days longer than those which have not been so nourished, thus favoring an incubation period of a parasite if such there be. (3) The presence of pellagra in Kansas has been confined almost entirely to one restricted locality. Of nine cases recorded last year, five were traced back to one town in which flies are usually abundant.

"These observations support the Sambon

theory, but against this theory is the fact that pellagra has never been produced in any other animal experimentally, either through inoculation or through transference by means of sand-flies.

"Since nearly all the cases of pellagra were in natives who had never been out of the state, the cause of pellagra exists in Kansas."

An article, entitled "Pellagra in Nyasaland," by H. S. Stannus in the Transactions of the Society of Medicine and Hygiene says in part:—

"Males were found to be more commonly attacked than females. The gangs of prisoners are employed chiefly in road-making and in clearing the streams in Zomba. The women, all non-pellagrous, are employed close to the prison.

"The prisoners' diet consists generally of rice; out of 131 pellagrous prisoners only four ate maize. Maize theories of causation are therefore excluded, but the facts observed are still consistent with an intoxication by damaged rice or grain, or with some deficiency in a grain diet consisting of rice or maize."

An article by Siler, Garrison and MacNeal, entitled "Pellagra: A Summary of the First Progress Report of the Thompson-McFadden Pellagra Commission," from the *Journal of the American Medical Association*.

"The Commission report that a study of the prevalence and distribution of the disease and of the dietary of the pellagrins and non-pellagrins in the same district gives no support to the view that the ingestion of maize (good or spoiled) is the essential cause of pellagra. A striking feature is the high incidence of the disease among females of the cotton mill village population between 19 and 45 years. Poverty of nutrition, child birth, tuberculosis and other weakening causes play important rôles as predisposing factors. The higher incidence of pellagra in the more populous districts and the indication of its occurrence in definite foci support the view that pellagra is a specific infection communicated from person to person, transmitted possibly by the blood-sucking insect *Stomoxys calcitrans*, possibly by the contamination of the food or by some other means as yet unknown."

An article entitled "The Cause of Pellagra" by L. Loften in the *International Journal of Surgery*.

"The author has met with nine cases of pellagra recently in which careful examination of the faeces was carried out, with the result that hookworm or hookworm eggs were found in every case. A history of hookworm infection was secured in every instance and it is pointed out that pellagra is always present where there is hookworm! The suggestion advanced is that pellagra and hookworm infection may be the same condition with different names, pellagra being regarded as the result of a 'latent hookworm poison.' No typical skin lesions were present in these cases. [The great prevalence of hookworm infection in some localities, *e.g.* 90 per cent. infected, makes it necessary to examine a large number of controls before assuming that pellagra or any similar condition can be attributed to hookworm infection.]"

American Open Air School Association.

At a meeting held in Philadelphia on April 25, this new national association was formed. The following resolutions were adopted:

WHEREAS, One problem confronting mankind is the conservation of the child, and

WHEREAS, The vitiated atmosphere of the ordinary schoolroom is a cause of physical and mental sub-normality in children.

Resolved, That the time has come for a comprehensive study of the effects of open window class-rooms and open air schools, on normal children;

Resolved, That the persons who, by virtue of their daily opportunity to observe the results of the practical application of the theory of the fresh air class-room, are best qualified to do this work; Therefore, the representatives of such schools, in meeting assembled, hereby organize the American Open Air School Association.

Resolved, That we commend this society to thoughtful individuals, scientists, educators, health officials, and all local and national bodies working for child welfare.

The following were chosen as officers for

the ensuing year: President, Dr. Allen G. Rice, Springfield, Mass.; vice-president, Dr. William H. Peters, Cincinnati, Ohio; secretary, Dr. Walter W. Roach, Philadelphia; treasurer, Mr. Albert H. Raub, District superintendent of public schools, Philadelphia.

Imhoff Tanks for Baltimore.

"An extension to Baltimore's sewage treatment works at the Back River is soon to be made. Calvin W. Hendrick, chief engineer of the sewerage commission, announced last week that the city will build a series of Imhoff tanks on a site adjacent to the present hydrolithic and sludge-digesting tanks. The new tanks will not replace the present ones but will be in the nature of an enlargement of the existing plant. The contract and specifications for the new tanks were approved by the Board of Awards on March 25 and bids for construction will be received until April 15. When the tanks are completed an exceptional opportunity for comparing their operating results with those from the present works will be afforded."

The Engineering Record, April 4.

Experts Report on Chicago Refuse-Disposal Plant.

"Provision for a $3,500,000 municipally owned refuse-disposal plant, consisting of a central reduction plant and small incinerators at each loading station, was recommended to the Chicago City Water Commission on March 31 by Irwin S. Osborn and John T. Fetherston, consulting experts, in their report to the city. It is recommended that household separation be employed and wharf connections made with the central plant. A complete remodeling of the loading stations, an increase in the number of stations, and the employment of a technical staff were also suggested."

A brief summary of this report is given in *The Engineering Record* of April 11.

Federal Studies of Sewage-Treatment Methods.

"In the past the United States Public Health Service has confined its activities very largely within medical limits, but of late the scope of its duties has been broadening. Among the first indications of its entrance into new fields were its stream-pollution studies, and now comes the announcement of an important program in the specialized field of sanitary engineering. This action was foreshadowed some months ago when Prof. Earle B. Phelps gave up his consulting practice in New York to enter the government service at the hygienic laboratory in Washington. Since his appointment he has been formulating plans and organizing a staff for the study of certain phases of the sewage-treatment problem. Although it is still too early to discuss the plans in detail it can be said that the investigations will cover two separate subdivisions of the general subject. The first subdivision—the design of works for the treatment of domestic sewage, with particular reference to plants for dwellings, hotels, institutions and very small communities—is in charge of Leslie C. Frank, a former member of the technical staff of Dr. Karl Imhoff. The second subdivision, which will deal entirely with the matter of trade wastes, is in charge of H. B. Hommon, who carried out the recent sewage-treatment studies at Akron and Cleveland.

"Coming at a time when the pollution of the Great Lakes along the boundary line between the United States and Canada is under investigation by the International Joint Commission, whose expert, Dr. Allan J. McLaughlin, is also an officer of the Public Health Service, the action of the service is significant, for it is the latest manifestation of Federal interest in the subject of sewage treatment as distinguished from the sanitary survey of waterways. The earlier work has been largely in the nature of a diagnosis, although the United States Geological Survey has published several water-supply papers treating of sewage-disposal methods. The new studies deal with the cure.

"A great deal of educational work will be required in this country before the problem of river pollution and sewage treatment can proceed along rational lines. This educational work is part of the program of the service. It is not proposed to usurp in any

way the functions of consulting engineers, but rather to bring the smaller towns, with limited financial resources, to a realization of the sanitary problems which they must eventually face and to emphasize the importance of securing expert advice before embarking upon any project for the correction of nuisances. If the Public Health Service can be instrumental in creating a sentiment which will make for the rational design of treatment works and operation under competent supervision it will have performed a valuable service and have prevented the squandering of vast sums on illadvised plans."

Engineering Record, April 11.

Licensing the Movies.

The growing popularity of the "cinemas" in England has led to the action noted in the following clipping from *The Medical Officer* of April 11.

"Acting on a suggestion of Dr. D. Morley Mathieson, M.O.H., the South Shields town council have decided that at the next licensing of picture halls in the borough clauses be inserted to secure the following: (*a*) That the local health authority, acting through the health committee on the advice of the medical officer of health, have power to require the exclusion from all performances in picture halls of children under 14 years of age, whenever in the opinion of the authority this step is desirable, and for such period as may appear to be necessary, with a view to preventing the spread of infectious disease. (*b*) That the arrangements for ventilation, natural lighting, and cleansing be adequate, and be carried out to the satisfaction of the the medical officer of health. (*c*) That 'continuous performances' of more than four hours' duration be prohibited."

Royal Commission on Venereal Diseases.

The work of the British Royal Commission on Venereal Diseases promises to be of such great importance that the opinions expressed at the various meetings are worthy of consideration. We clip the following from *The Medical Officer* of April 11:—

"At the twenty-seventh meeting of the Royal Commission on Venereal Diseases evidence was given on behalf of the Society of Medical Officers of Health by Dr. Chalmers, the medical officer of health for Glasgow and president of the society, and by Dr. Parkes, medical officer of health for Chelsea.

"They drew attention to:—

(1) The lack of exact information regarding the present prevalence of syphilis and other venereal diseases either as causing illness or death.

"(2) The misleading or incomplete character of certified causes of death, particularly of the remote causes in death from diseases of the nervous or circulatory system.

"(3) The absence generally of any systematic provision for the recognition and treatment of the diseases in question.

"(4) The relationship of syphilis to miscarriages, still-births and deaths among infants in the first year of life, especially the first four weeks.

"They recommended that the Local Government Board should issue an order declaring venereal diseases to be endemic diseases threatening the health of the population, and that the board should make regulations governing the provision of facilities by the local authorities.

"It was necessary, they thought, that the local authorities should be assisted by a considerable grant in aid from government funds."

First Aid in Railway Accidents.

The following brief note in regard to the German method of ameliorating conditions in railway wrecks is clipped from the April 11 issue of the *Journal of the American Medical Association:*

"German railways provide a first-aid train in case of railway accidents. It consists of a locomotive and two cars, the one a work car with workmen and all necessary apparatus for clearing the tracks, releasing wounded people who are caught in the wreckage, repairing the track and setting traffic in motion again. The other is a hospital car, provided with all necessary instruments for emergency operations, bandages, dressings, medicines, operating table, stretchers and

eight beds in which patients can be transported to the nearest hospital. The personnel of these cars, workmen, doctors, nurses, etc., are all within call so that they can be reached very quickly after news of an accident is received, and they have drills in practice so that when an actual call comes they are expert in preparing for action quickly, sterilizing, getting operating and anesthesia tables, sutures, instruments, etc., ready. Every preparation is made on the way to the scene of the accident, so that they are ready to begin work when they arrive. These trains are stationed at frequent enough intervals along the road, so that the most isolated spot can be reached within two hours after an accident has occurred. Dr. Gilbert describes their work in *Archiv für Rettungswesen*, 1913, i, 140, and gives a further account not only of the medical work but of the work of the train crew in notifying oncoming trains, sending word to the railway officials and families of the dead and wounded, clearing the tracks for traffic and all the multitudinous details that have to be attended to in such catastrophes."

Pure Ad Bill Passed.

"The municipal assembly at St. Louis has passed the Pure Ad bill, making fake ads illegal. The bill had the indorsement of the St. Louis Medical Society, the Advertising League of St. Louis and other civic bodies. The bill was opposed by optometrists, the publisher of a medical journal and some retail merchants. The bill fixes a penalty of $100 to $500 for violation, and applies to all forms of advertising."

Journal of the American Medical Association, April 25.

London's Health in 1912.

The Medical Officer of April 18 contains a brief note of the report of the medical officer of health of the county of London for 1912. From this we clip the following:—

"The population of the county of London, estimated at the middle of 1912 at 4,519,754, is that of some continental nations, and this large number is so crowded together that there are no less than 38,000 persons living on each square mile within the administrative area of the county council, which is 75,000 acres in extent. The number of children born during the year was 110,353, and the deaths numbered 61,100. Either of these numbers are equal to the population of a good-sized city. The birth-rate, 24.5 per 1,000, and the death-rate, 13.6 per 1,000, were each lower than those recorded in any previous year. Dr. Hamer states very graphically that the lessened death-rate from all causes, when compared with the average rate in the previous ten years, means a saving of 10,065 lives. It is satisfactory to learn that the infant mortality rate of 91 per 1,000 births was also lower than that of any previous year. The labors of official health visitors and of the many undertakings in the metropolis having for their object the saving of infant life are no doubt largely responsible for this desirable result. There is no doubt, moreover, that the mothers of the present day among all classes of society are learning the lesson of child rearing in a much more practical and thorough manner than it was taught to former generations."

Uncle Walt on the Early Fly.

The early fly's the one to swat. It comes before the weather's hot, and sits around and files its legs, and lays at least ten million eggs, and every egg will bring a fly to drive us crazy by and by. Oh, every fly that skips our swatters will have five million sons and daughters, and countless first and second cousins, and aunts and uncles, scores of dozens, and fifty-seven billion nieces; so knock the blamed thing all to pieces. And every niece and every aunt—unless we swat them so they can't—will lay enough dodgasted eggs to fill up ten five-gallon kegs, and all these eggs, ere summer hies, will bring forth twenty trillion flies. And thus it goes, an endless chain, so all our swatting is in vain unless we do that swatting soon, in Maytime and in early June. So, men and brothers, let us rise, gird up our loins and swat the flies! And sisters, leave your cozy bowers where you have wasted golden hours; with ardor in your souls and eyes, roll up your sleeves and swat the flies!—*Walt Mason*.

COMMUNICATIONS.

To the Editor,

DEAR SIR:—In the Mortality Statistics for 1912, recently published by the Bureau of the Census, appears on page 335 a statement of four deaths from tuberculosis of the lungs in infants less than one day old, and two deaths from the same cause in infants one day old. This statement is made from returns collected in the registration area.

Since one day of life only is too short a time for demonstration of tuberculosis by the inoculation test, diagnosis of tuberculosis in these six cases, and especially specific diagnosis of tuberculosis of the lungs, is but guesswork, in the absence of post-mortem examination. Physicians will understand the improbability of a necropsy having been done in even a majority of these six cases.

Correspondence with the Bureau of the Census develops the fact that there is no mention of post-mortem examination on the records used by the Bureau of the Census in compiling the statistics in question. "The compilation is made according to the statements received upon the transcripts, which are official copies of the original certificates on file in the state or city offices."

The Bureau of the Census is clearly not responsible for such undependable reports. It is continually endeavoring to increase accuracy in vital statistics. In the Physicians' Pocket Reference to the International List of Causes of Death, published by the Bureau in 1913, appears on page 12 the advice, referring to the cause of death when indefinite, "If the physician is absolutely unable to satisfy himself in this respect, it is better for him to write Unknown than merely to guess at the cause."

Surely this concrete instance is sufficient evidence that the suggestion quoted from the Pocket Reference is entirely applicable.

I wish to thank Dr. Henry Koplik for suggestions made in corresponding upon this matter.

THEODORE C. MERRILL, M. D.
WASHINGTON, April 26.
1744 Columbia Road.

To the Editor,

DEAR SIR:—In my paper on "Vital Statistics in Some Municipal Reports," published in the February issue of the JOURNAL, I regret that an injustice was done to the city of Youngstown, Ohio. That city does not include stillbirths in its tables of deaths and makes a definite statement to that effect in connection with the tables published in its annual report.

Very truly yours,
CRESSY L. WILBUR.
WASHINGTON, April 13, 1914.

PERSONAL NOTES.

The following were elected to membership in the American Public Health Association May 1, 1914:

Thomas Franklin Abercrombie.
L. C. Allen, M. D.
William Allan Claxton.
Charles F. Dawson.
Leslie Carl Frank.
Henry Fauntleroy Harris, M. D.
Edward M. L'Engle, M. D.
L. B. McBrayer, M. D.
Eugene Edmund Murphey, M. D.
Henry Van Dyke Stewart.
Elmore C. Thrash.
Miss Jane Van DeVrede.
Miss Jessamine S. Whitney.
Alfred V. Wood.
Iva Catherine Youngmans, M. D.

Dr. Gustav F. Ruediger announces his resignation as director of the State Public Laboratories and Professor of bacteriology and pathology in the University of North Dakota to accept the position of director of the Hygienic Institute and health commissioner for La Salle, Peru and Oglesby, Ill., under an endowment by Hon. F. W. Matthiessen. His future address is La Salle, Ill.

CURRENT PUBLIC HEALTH LITERATURE.

AMERICAN.

American Journal of Diseases of Children, Chicago.

VII, No. 4. Apr.

Incubation Period. No. 1—Serum Disease. D. M. Cowie.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans.

I, No. 9. Mar.

Epidemic of Paratyphoid Fever. A. N. Sinclair.
Growth of Filaria Embryos in Vitro. F. M. Johns and P. L. Querens.
Innocuous Bites of Malaria and Yellow Fever Mosquitoes During Daytime. E. Ecchevcrria.
Health Survey. W. H. Deaderick.

Archives of Ophthalmology, New Rochelle, N. Y.

XLII, No. 2. Mar.

Experiments on Cultivation of So-called Trachoma Bodies. H. Noguchi and M. Cohen.

Boston Medical and Surgical Journal.

CLXX, No. 15. Apr. 9.

Further Observations of Seasonal and Meteorologic Influence upon Tubercular Patients. N. R. Burns.

Bulletin of Johns Hopkins Hospital, Baltimore.

XXV, No. 277. Mar.

Brief History of Quarantine. W. W. Ford.
Tattoo Marks for Identification of Animals in Laboratories. J. A. Hunnicutt and A. P. Jones.

Engineering Record, New York.

LXIX, No. 15. Apr. 11.

Operating Results of Water-Purification Plant at Columbus.
Iron-Removal Plant at Urbana.
Refuse Collection and Disposal in Chicago.

LXIX, No. 16. Apr. 18.

Joint Commission's Remedies for Boundary Water Pollution.
Ottawa's Water Controversy.
Proposed System to Supply Water to Richmond, Cal.

Iowa State Medical Society Journal, Washington.

III, No. 9. Mar.

Public Health Work of Twenty-Seven Iowa Cities and Towns. M. F. Boyd.

Journal of Experimental Medicine, New York.

XIX, No. 4. Apr.

Penetration of Virus of Poliomyelitis from Blood into Cerebro-Spinal Fluid. S. Flexner and H. L. Amoss.

Journal of Infectious Diseases, Chicago.

XIV, No. 2. Mar.

Pasteurization in Bottles and Process of Bottling Hot Pasteurized Milk. S. H. Ayers and W. T. Johnson.
Non-Cholera Vibrio Resembling True Cholera Vibrio and Pigment-Forming Vibrio. J. G. Drennen.
Disinfectant Action of Certain Bacterial Stains. A. M. Jansen.
Trachoma and Allied Conditions in New York School Children. A. W. Williams and others.
Absorption of Antitoxin and Agglutinin Injected Subcutaneously. W. H. Park, L. W. Famulener and E. J. Banzhaf.
Serum Sensitization and Dosage of Antitoxin. W. H. Park, L. W. Famulener and E. J. Banzhaf.
Protective Enzymes, Immune Sera and Anaphylaxis. R. M. Pearce and P. F. Williams.

Journal of the American Medical Association, Chicago.

LXII, No. 14. Apr. 4.

Methods of Examination of Illiterates for Mental Defectiveness. M. H. Foster.
Paratyphoid Fever with Report, Including Ex Post Mortem Examination, of a Fatal Case of the "A" Type. Leverett Dale Bristol.
Some New Cameras for Laboratory Use. Louis B. Wilson.
The Tuberculosis Problem.—*Continued.*

LXII, No. 15. Apr. 11.

The Bacillus Aerogenes Capsulatus in Blood-Cultures, with Recoveries. Albert Howard Baugher.
Sporotrichosis of the Eye. Fred J. Fassett.
An Interesting Case of Chronic Lead Poisoning with Relapse Following Fresh Exposure. J. M. Anders.
The Tuberculosis Problem. *Continued.*

LXII, No. 16. Apr. 18.

A Simplification of the Gram Stain. Louis D. Smith.
The Tuberculosis Problem. *Continued.*

LXII, No. 17. Apr. 25.

The Tuberculosis Problem. *Concluded.*

New York State Journal of Medicine.

XIV, No. 3. Mar.

Certified Milk of Medical Society of County of Westchester. B. F. Drake.
Streptococcic Throat Disease. H. J. Ball.

Public Health Reports, Washington.

XXIX, No. 13. Mar. 27.

Quinine Prophylaxis for Malaria. H. R. Carter.
Car Sanitation. Cleansing and Disinfection of Railroad Coaches. A. D. Foster.
Blindness in Cebu. Louis Schwartz.

XXIX, No. 14. Apr. 3.

The Notifiable Diseases. Their Prevalence in Cities During 1812.
The Infectious Diseases, Recent Additions to Our Knowledge of their Etiology. John F. Anderson.

XXIX, No. 15. Apr. 10.

Malarial Fevers in the United States. R. H. von Ezdorf.
The Pollution of Tidal Waters. Hugh S. Cumming.

XXIX, No. 16. Apr. 17.

Typhus Fever.
Ship Rats and Plague.
Screening as an Anti-Malarial Measure. H. R. Carter.
Endemic Goitre. Its Possible Relationship to Water Supply. Taliaferro Clark and Claude C. Pierce.
Treatment of Rabies. Report of a Case Treated Unsuccessfully with Quinine. C. L. Williams.

FOREIGN

Arbeiten aus dem Kaiserlichen Gesundheitsamte.

XLVII, Bd. 1 Heft. Jan.

The Destruction of Anthrax Spores on Skins and Hides by Solutions of Common Salt and Hydrochloric Acid. E. Hailer.

Studies on Formaldehyde: The Formaldehyde Gas and its Polymers. F. Auerbach.

Beitrage zur Klinik der Tuberkulose, Wurzburg.

XXXI.

Study of Tuberculosis Death Rates. K. Dorner.

Berliner Klinische Wochenschrift.

LI, No. 9. Mar. 2.

Experimental Research on Smallpox Virus. H. A. Gins.

Tubercle Bacilli in the Blood Stream. F. Klemperer.

British Medical Journal, London.

No. 2776. Mar. 14.

Hygienic Aspect of Coal Mining Industry in United Kingdom.—*Continued.* A. F. Shufflebotham.

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